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13. ABSTRACT ***(Maximum 200 Words)***

The overall Hypothesis is that the decline in physical activity habits and resultant increase in body fat reduces exercise capacity and muscle mass in military women. These lifestyle changes worsen cardiovascular risk factors. Therefore, continued involvement in resistance and endurance training exercise programs, which increases or preserves fat free mass, as well as enhances physical activity will prevent functional declines in military-eligible women. Although exercise is frequently recommended to enhance overall fitness, it is unclear as to whether endurance or resistance exercise is more effective in attenuating functional and cardiovascular declines in women. We systematically compared the effects of endurance and resistance exercise on physical activity, cardiovascular fitness and fat metabolism in military eligible women.

To accomplish this objective, women (18-34 yrs.) were randomized to a six-month endurance training, resistance training or control group. We examined the following dependant variables: 1) free-living physical activity using doubly labeled water and indirect calorimetry; 2) body composition and body fat distribution using x-ray absorptiometry and computerized tomography; 3) in-vivo fat oxidation from ^{13}C palmitate; and 4) insulin sensitivity from hyperglycemic/euglycemic clamps. Our results provide new information on energetic and physiological effects of endurance and resistance on energy metabolism and fuel utilization in women.

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INTRODUCTION:

This proposal responds directly to the recommendations for research as outlined by the Institute of Medicine: **Recommendations for Research on the Health of Military Women**. Our proposal specifically addresses the request for research on the effectiveness of different types of physical training programs for women in the military.

Although physical activity is routinely prescribed for military-eligible women, a systematic examination of the effects of different modes of training on women's physiology and work performance has not been undertaken. Specifically, the decline in physical activity and loss of fat-free mass are significant predictors of decreased function and increased cardiovascular risk in military-eligible women. Thus, exercise interventions specifically designed to offset these deleterious changes in work performance, body composition and physical activity are important considerations. All military women initially experience the physical challenges of basic training and once through this experience, the new soldier experiences additional physical challenges that are directly influenced by other military-related activities including, deployment, natural aging, etc. Moreover, given the increased number of career military women retained in the services, strategies to achieve and maintain optimal fitness are of high priority.

Although exercise is recommended to military women, it is unclear as to which type of exercise is most effective in maintaining physical fitness and body composition in an effort to reduce cardiovascular risk and enhance physical function. This proposal will address several health benefits of endurance and resistance exercise in military eligible women in an effort to establish guidelines to maintain optimal cardiovascular and metabolic fitness in military-eligible women. **Results from this study will lay the scientific groundwork for the prescription of endurance and/or resistance exercise as the optimal mode of exercise to maintain physical fitness, work performance and reduce cardiovascular risk in military eligible women.**

The overall hypothesis is that the decline in physical activity habits and resultant increase in body fat reduces exercise capacity and muscle mass in military women. These lifestyle changes worsen metabolic and cardiovascular risk factors. Therefore, continued involvement in resistance and endurance exercise programs, which increases or preserves fat-free mass, will prevent functional declines in military-eligible women. Although exercise is frequently recommended to enhance overall fitness, it is unclear as to whether endurance or resistance exercise is more effective in attenuating functional and cardiovascular declines in women. We will systematically compare the effects of **endurance** and **resistance** exercise on physical activity, cardiovascular fitness, and fat metabolism in military eligible women. The results of this study will lay the groundwork for appropriate exercise prescriptions to reduce cardiovascular and metabolic risk and enhance physical function in military-eligible women.

1. AIMS AND HYPOTHESES:

AIM #1: To determine the effects of endurance exercise and resistance training on free-living physical activity and cardiovascular fitness in military-eligible women.

AIM #2: To determine the effects of endurance training and resistance training on body composition and body fat distribution.

AIM #3: To determine the effects of low intensity endurance vs. resistance training on in-vivo fat metabolism and insulin sensitivity.

2. BACKGROUND AND SIGNIFICANCE

Although increased physical activity is recommended to women, it is unknown as to the type of exercise that is most effective in attenuating functional declines and improving metabolic fitness. We will directly compare the effects of **endurance** and **resistance** training on: 1) free-living physical activity and cardiovascular fitness, 2) body composition and body fat distribution; fat metabolism, and insulin sensitivity in military-eligible women.

(2a) Exercise and Energy Expenditure.

One important reason to prescribe exercise is to increase daily energy expenditure and physical activity to maintain proper levels of body weight and composition. The influence of different types of exercise to achieve this goal has not been systematically examined in women.

Are endurance and resistance exercise effective interventions to increase resting and physical activity-related energy expenditure? A compelling goal of physical training programs is to increase physical activity and energy expenditure. It is presently unknown whether training programs accomplish this goal, as physical activity levels outside of the exercise program could not be accurately measured. This proposal will provide new information on the impact of endurance and resistance exercise programs on resting and physical-activity related energy expenditure.

Resting metabolic rate is the largest component of daily energy expenditure in humans (1). A low resting metabolic rate is a significant predictor for body weight gain (2), which may partially explain increases in body weight in women. We have also found the women have a lower resting metabolic rate per kilogram of fat-free mass (3). Collectively, these findings underscore the importance of exercise interventions that would increase resting energy expenditure in women in an effort to offset increases in body weight over time.

It is encouraging to note that both endurance and resistance training has been found to increase resting metabolic rate in women (1). However, its effects on free-living physical activity are of greater interest with respect to regulation of energy balance. Changes in physical activity constitute a large proportion of variation in daily energy expenditure.

Moreover, low levels of physical activity are a significant predictor of an increase in body weight over time (4).

We recently performed a study to examine the effects of endurance exercise on free-living energy expenditure outside of the exercise program. We found that women actually reduced their free-living physical activity during non-exercising time in response to endurance training (5). This physiological adaptation is counter-productive to the goals of the military, which strive to increase daily energy expenditure through physical exercise. It is possible that the intense level of the exercise program (85% of VO_2 max) may have contributed to this finding. This study raises new questions regarding the optimal exercise mode to enhance free-living physical activity in women. **This proposal will provide new information on the effects of endurance exercise on free-living physical activity by administration of doubly labeled water and the subsequent measurement of free-living physical activity.**

Much interest has recently focused on resistance training as an intervention to enhance muscular strength, restore physical function and reduce cardiovascular risk (6). The impact of resistance training, however, on physical and metabolic function has received less attention than endurance training, particularly in women. Resistance training is an effective stimulus to increase muscular strength and fat-free mass in untrained adults (6). The anabolic nature of resistance training may reverse declines in resting metabolic rate by increasing fat-free mass (7,8). We have no information, however, on the effects of resistance training on free-living physical activity in women. Resistance training may enhance free-living physical activity by several mechanisms: 1) an increase in protein synthesis (9); 2) an increase in sympathetic nervous system (8) and 3) increased levels of fat-free mass. In this study, we will provide new information on the effects of endurance exercise and resistance training as therapeutic interventions to increase free-living physical activity and maintain muscle mass in military-eligible women.

(2b) Exercise, Intra-abdominal Fat and Insulin Sensitivity

What are the effects of endurance and resistance exercise on body fat distribution and insulin sensitivity? We have included in the proposal an examination of the effects of exercise on the metabolic risk factors of insulin and fat metabolism. The rationale for their inclusion is twofold: 1) changes in physical activity and body composition in response to training positively influence these variables and 2) the insulin resistance syndrome is an independent risk factor for cardiovascular (10). It is only recently, however, that the role of exercise to reduce intra-abdominal fat has been examined, and to our knowledge, no information is available in women.

Schwartz et al (11) found that six-month endurance training induced a preferential loss of fat from the abdominal region. Despite the relatively small changes in body weight (<2 kg) and body composition, impressive (>20%) decrements were found in intra-abdominal fat. These changes were associated with improved lipid lipoprotein profiles. Tonino (12) demonstrated an increase in insulin sensitivity with the euglycemic clamp technique in men following an aerobic exercise-training program, which did not substantially affect body composition. Houmard et al (13) exercise trained 13 middle-aged men, but found that a reduction in central body fat, as measured from the waist circumference, was not related to an improvement in insulin sensitivity. Alternatively, Kirwan et al (14) noted that regular exercise was effective in reducing hyperinsulinemia and improving insulin sensitivity and that these changes were related to the reduction in the waist circumference. Khort et al (15) showed that a higher waist circumference was related to a lower rate of glucose disposal in men. Unfortunately, no systematic investigation of the effects of exercise on insulin sensitivity and body fat distribution has been undertaken in women.

Most studies have focused on endurance training, whereas less attention has been directed towards the effects of resistance training on intra-abdominal body fat and insulin sensitivity. However, because isometric contractions produce insulin-like effects on glucose uptake in skeletal muscle (16) and muscle mass serves as the principal site of glucose disposal, resistance training could be an important intervention to enhance insulin action in women. Recent reports provide support for this hypothesis. Ross and Rissanen (17) found that the combination of energy restriction (1000 kcal/day) and either resistance or aerobic exercise induced significant reductions in intra-abdominal fat. This was a surprising finding given the fact that the direct energy cost of the endurance exercise program was substantially higher than the resistance-training program. This finding suggests that changes in the other components of total daily energy expenditure (resting metabolic rate or physical activity) may have occurred that significantly increased the total daily energy expenditure of the resistance-training program.

Several investigators examined changes in insulin sensitivity in response to resistance training. For example, insulin responses to an oral glucose challenge were found to be lower in younger individuals after resistance training (18), and in some cases glucose tolerance was improved similarly in endurance and resistance training (19). Miller et al (20) showed that 16 weeks of strength training improved the insulin response to glucose ingestion in young males, which they attributed to an increased muscle mass. Data from our laboratory showed that strength training increased non oxidative glucose metabolism by 45% in men (21). To our knowledge, no studies have directly compared the effects of endurance vs. resistance training on changes in intra-abdominal body fat and associated changes in glucose metabolism in women.

(2c) Exercise and Fat Metabolism.

What are the effects of endurance and resistance exercise on fat oxidation? We feel is it is important to include a measure of fat oxidation in the present study to help explain the mechanisms related to changes in insulin sensitivity. It is reasonable to hypothesize that the loss of intra-abdominal body with exercise training programs will be associated with improvement in insulin sensitivity. This is based on the fact that adipose tissue in the visceral region is highly sensitive to lipolytic stimuli, particularly in those regions drained by the portal circulation (22). As a consequence, increased fat oxidation as a result of exercise would reduce the delivery of free-fatty acids to the liver, thereby reducing gluconeogenesis and stimulating hepatic insulin clearance. This would lead to lower circulating concentrations of insulin and increased insulin sensitivity (23). However, the optimal exercise mode to maximize loss of intra-abdominal fat and improve insulin action has not been clearly established.

The majority of knowledge regarding the effects of exercise on fat oxidation has been primarily derived from endurance training studies and from measurements of circulating concentrations of substrates considered to be representative of lipolytic action (24,25). More recently, we have used in-vivo techniques to quantify fat metabolism in humans. We showed that endurance training increased levels of fat oxidation in healthy women (26). However, less information is available regarding the effects of resistance training on fat oxidation in younger women. Pratley et al (8) showed that 16 weeks of resistance training increased plasma levels of norepinephrine in men, but no changes were noted in fat oxidation. Melby et al (27) showed that resistance exercise elevated post exercise metabolic rate and fat oxidation 15-hr after exercise completion. They suggested that resistance exercise might be beneficial in weight control because of the direct energy cost of the activity, the residual elevation of post exercise VO_2 and the greater post-exercise fat oxidation. Work from our laboratory shows that fat-free mass is an important regulator of the rate of appearance of fatty acids into circulation and fat oxidation in women (28,29). Thus, resistance training may elevate the level of fat oxidation by increasing the metabolic demand for fatty acids by increasing skeletal muscle mass as well as the level of daily energy expenditure and physical activity. This study will provide new insight into the effects of endurance and resistance training on insulin sensitivity and fat oxidation in military-eligible women.

Collectively, this will be the first proposal to systematically examine the effects of endurance and resistance training on a comprehensive battery of cardiovascular and metabolic risk factors in military-eligible women.

3. WORK ACCOMPLISHED:

Intervention Studies

We examined the effects of exercise training on changes in total daily energy expenditure and physical activity. We subjected women to 8 weeks of intense endurance training in which resting metabolic rate, body composition and nor epinephrine kinetics were measured (30,31). We found that resting metabolic rate increased by 10% (150 kcal/d), without significant changes in body composition. These results suggest that endurance training increases resting energy needs in women. These results prompted further studies with doubly labeled water to examine the effects of exercise on daily physical activity, the true determinant of energy balance. **These studies document our ability to carry out and retain women in exercise intervention studies.**

We used doubly labeled water to assess the effects of exercise on free-living energy expenditure (5). We found that individuals became more inactive during their non-exercising time in response to a high intensity endurance exercise. We found that endurance training resulted in a 62% reduction in the energy expenditure of physical activity outside of the exercise program (571 ± 383 to 340 ± 452 kcal/d). The results underscore the importance of using doubly labeled water to determine the effects of endurance or resistance exercise on daily energy expenditure in women. **This study documents our ability to use doubly labeled water methodology in exercise intervention studies and raises new questions regarding the type of exercise that is most efficient in increasing physical activity in military-eligible women.**

Fat Metabolism:

In a series of studies, the effects of endurance training on fat oxidation in women were assessed. Free fatty acid appearance rate and fat oxidation were determined from ^{14}C palmitate infusions and indirect calorimetry (26). In response to endurance training, free fatty acid appearance did not change, but fat oxidation increased (200 ± 12 vs. 244 ± 16 $\mu mol \cdot min^{-1}$; P<0.01). These results support the notion that endurance training increases fat oxidation in the basal state. Furthermore, individuals who increased total daily energy expenditure and physical activity also showed higher levels of fat oxidation (r=0.55; P<0.05). **These findings led us to propose to test the hypothesis that significant increases in total daily energy expenditure and physical activity (by endurance or resistance exercise) will enhance fat oxidation, promote loss of intra-abdominal fat and increase insulin sensitivity in military-eligible women.**

Resistance Training:

We examined relationships of resting metabolic rate to cardiovascular disease risk in middle-aged women characterized as resistance trained, aerobic trained or untrained (33). Resting metabolic rate, after normalization for differences in fat-free mass, was 7% higher in aerobic and resistance-trained women compared to untrained women. Both aerobic and resistance trained individuals were expending approximately 200 kcal/d more at rest when compared to untrained individuals. These results suggest that resistance and aerobic training can serve as suitable interventions to offset the decline in resting metabolic rate in military women. **We now propose a resistance training study in which daily energy expenditure can be measured to assess it relation to enhanced functional capacity and cardiovascular risk factors in military eligible women.**

The effects of resistance training, with and without weight loss, on endogenous insulin secretion and peripheral tissue glucose utilization was examined in postmenopausal women (34). Women trained three times per week for 16 weeks on resistance machines. Body composition was measured from dual-energy x-ray absorptiometry. Despite weight loss, fat-free mass was maintained in weight loss groups by concomitant resistance training. The endogenous insulin response decreased 24% with resistance training and 42% with resistance training and weight loss, with no change in glucose utilization. These results suggest that peripheral tissue sensitivity to endogenously secreted insulin improved to a greater extent with resistance training and weight loss rather than resistance training alone. However, resistance training increased insulin sensitivity in both groups. These results suggest that increased adiposity and glucose intolerance associated with the post-menopausal state could be prevented with resistance training and weight loss. **We now**

propose to study the mechanism of the increase in insulin sensitivity in military-eligible women by examining in-vivo fatty acid utilization and oxidation.

Significance of Proposed Work:

The adaptive responses of military-eligible women to endurance and resistance training have been an understudied area of research. The combined used of doubly labeled water methodology, multi compartment models of body composition, and substrate measures of insulin sensitivity and fat oxidation will provide new information on the effects of resistance and endurance exercise to cardiovascular and metabolic risk factors. Our preliminary data demonstrates our ability to successfully conduct exercise studies in women; perform sophisticated measured of energy expenditure and substrate metabolism. **Results from this study will lay the scientific groundwork for the prescription of resistance and endurance exercise to enhance cardiovascular and metabolic fitness in military eligible women.**

BODY OF THE REPORT:

SUBJECT SELECTION:

We successfully recruited 89 military eligible, non-pregnant women (18 to 35 yrs.) for this study. Of the 89 women recruited, 58 women completed the study with a dropout rate of 32%. The endurance group consists of 20 women; the resistance group; 20 women and the control group; 18 women. Volunteers were screened by telephone to ensure that they met the study inclusion criteria and are free of exclusionary criteria. Eligible subjects were scheduled for a screening visit at which time the study was explained in detail and a written informed consent was obtained. A fasting blood profile, a urinalysis, fasting and two hour postprandial glucose and a resting EKG was also obtained.

Criteria for subject inclusion was: premenopausal and age between 18 to 35 years, a body mass index between 18 and 25 kg/m^2. Exclusion criteria included a history or evidence on physical examination or testing of the following: 1) diabetes; 2) orthopedic limitations or history of pathologic fractures, 3) hypertension (>160/90 mmHg; 4) use of prescription or over the counter medications which could affect glucose metabolism (including insulin and oral hypoglycemic agents), 5) smoking.

EXPERIMENTAL DESIGN:

Volunteers were randomly assigned to a 6-month **endurance, resistance training or control group**. All subjects were weight stabilized and given dietary advice to consume a diet containing at least 250g of carbohydrate per day prior to testing. Diets were not changed throughout the program. All tests were performed during the follicular phase of the menstrual cycle. The testing sequence is described below:

Testing Sequence:

1. Recruiting: Telephone screen and advertising

2. Screening visit (1 day)

(a) Physical exam and history

(b) Graded exercise test

(c) Oral glucose tolerance test

(d) Blood chemistry and profile

3. Dietary Instruction, Body Weight Stabilization (2 weeks)

(a) Two weeks of dietary instruction for body weight stabilization and adequate carbohydrate intake. Perform test of VO_2 max test during this period to avoid interference of vigorous exercise with other metabolic tests.

4. Overnight Visit to the University of Vermont (1 day)

(a) Administration of Baseline Doubly Labeled Water (afternoon of admission)

(b) Computerized Tomography Scan (afternoon of admission)

(c) Resting Metabolic Rate

(d) Dual Energy x-ray Absorptiometry Scan

(e) Fatty Acid Kinetics

(f) Perform Insulin Clamp

5. Return visit (10 days later)

(a) Urine collections of doubly labeled water

6. Random assignment to Endurance, Resistance or Control group

7. Tests During Exercise Programs

(a) Re-assessment of strength to maintain exercise prescription

8. 6 month Post-testing Period:

(a) Testing sequence is identical as described in 3, 4 and 5 (testing conducted at least 48-72 hours after last exercise session)

METHODS:

The **METHODS** section is subdivided into the following categories:
(1) Endurance Training, Resistance Training and Control Group
(2) Energy Expenditure
(3) Body Composition and Body Fat Distribution
(4) Insulin Sensitivity
(5) Fat Metabolism

(1) INTERVENTIONS:

(a) Endurance Training Program

All endurance exercise sessions were preceded by a 10 min warm-up, which consisted of stretching of the major muscle groups and slow walking on a treadmill or indoor track. The women exercised three times per week using the Racquets Edge Health and Fitness Center. The training sessions consisted of an individually prescribed duration and intensity. To monitor adherence to prescribed training plan, volunteers wore a heart rate monitor (Polar Accurex, Polar Electronics Inc.) during each training session. The women were taught to monitor their heart rates during their exercise session. A warm-down was performed after the treadmill session and consisted of flexibility exercises. Data of individuals are considered in the statistical analysis that attended at least 80% of all exercise sessions.

The women were taught to monitor their heart rates. The first 4 weeks consisted of 25 minutes of slow jogging and/or brisk walking at 60% of HR_{max}. Thereafter, every 4-week period would be performed as follows: at the beginning of the 4-week period, time would increase by 5 minutes and intensity would increase by approximately 10% of max heart rate every week (from 60% at week 1 to 90% at week 4). At the beginning of the next 40- week period, time would increase by another 5 minutes and the intensity would be scaled back to 60% of HR_{max}. On week 16, women were walking or jogging for 40 minutes at 90% of HR_{max}. (Table 1)

Women followed a detailed program of specific workouts aimed at increasing exercise duration and intensity. The interval sessions consisted of 45 minutes of 80-90%HR_{max} training on Monday, 5-minute periods at 95% HR_{max} with 3-min rests on Wednesday, and 45 minutes at 80-90% of HR_{max} on Friday. (Table 2)

By the end of 6 months of endurance training, volunteers expended approximately 600-800 kcal per session, or an additional increase of 2400 to 3200 kcal per week generated by the direct energy cost of the exercise. The quantity of expenditure was substantial but realistic to perform when an adequate adaptation period is built into the study. Dr. Dvorak (a fellow in Dr. Poehlman's laboratory), hired personal trainers will supervise the exercise program.

Duration of exercise	Week 1	Week 2	Week 3	Week 4
25'	70%	75%	80%	85%
	Week 5	**Week 6**	**Week 7**	**Week 8**
30'	75%	80%	85%	90%
	Week 9	**Week 10**	**Week 11**	**Week 12**
35'	75%	80%	85%	90%
	Week 13	**Week 14**	**Week 15**	**Week 16**
40'	75%	80%	85%	90%
	Week 17	**Week 18**	**Week 19**	**Week 20**
45'	80%	85%	90%	
	Week 21	**Week 22**	**Week 23**	
50'	80%	85%	90%	
	Week 24	**Week 25**	**Week 26**	
55'	80%	85%	90%	

Table 1. Endurance exercise training program: Base training phase (weeks 1-16).
(% Represents the percentage of HR_{max} obtained during the peak oxygen consumption test)

Week	Duration	Monday	Wednesday	Friday
21	45'	80%	85%	90%
22	45'	Interval 1	80%	85%
23	50'	80%	80%	Interval 2
24	50'	80%	85%	90%
25	50'	Interval 3	75-80%	80%
26	55'	85%	85%	90%
27	55'	90-95%	Interval 4	80%
28	60'	80%	80-85%	85%

Interval 1: warm-up; 20' @ 90-95%, 15' slow jog, 10' @ 90-93%
Interval 2: warm-up; 3 * (10' @ 91-94%, 5' slow jog)
Interval 3: warm-up; 5 * (5' @ 92-95%, 4' slow jog)
Interval 4: warm-up; 8 * (3' @93-96%, 3' slow jog)

Table 2. Endurance exercise training program: Interval training (weeks 17-24)
(% Represents the percentage of HR_{max} obtained during the peak oxygen consumption test)

(b) Resistance Training Program

The resistance-training program was designed to stimulate optimal gains in muscular size and strength over the 6-month training period. Women trained on three non-consecutive days during the week (e.g., Mon, Wed, Fri). Variation in training will enhance the quality of the exercise stimulus by improving the adherence to the training program and reducing the potential boredom often associated with the use of a redundant resistance training protocol.

Women were individually instructed in the performance of each exercise and allowed to practice the exercise and strength testing protocol several times prior to initial testing and the start of the training program. Prior to strength testing, two resistance-training sessions were conducted so that women could become familiar with the equipment and proper exercise techniques.

Each training session included a warm-up of low intensity walking or cycling for 5 min, followed by a 10 min of static stretching of all the major muscle groups used in training. Each exercise session was individually monitored for optimal progression. The resistance program consisted of the following exercises: 1) Leg press, 2) Leg Extensions; 3) Hamstring Curls; 4) Chest Press; 5) Seated Rows; 6) Shoulder Press; 7) Bicep Curls; 8) Tricep Extenions; 9) Abdominals. These exercises provided a total body resistance-training program for all of the major muscle groups of the body. Cybex weight training equipment (located in the Racquets Edge Health and Fitness Center) was used.

The basic prescription was to perform three sets of ten repetitions for individual lift, with sixty second breaks between the sets. In addition, volunteers lifted the weight to failure during the last set, more specifically; they were able to perform at least six but no more than 12 repetitions. When they reached the level of performance so that they could perform 12 repetitions during the last set, the resistance was increased for the next training session. This ensured the necessary level of overload for each training session.

Because of the need for test specificity, 1 RM evaluations of certain exercises used in the training program provided the most direct evaluation of the training gains made over the 6-month period. The 1-RM is defined as the maximum amount of resistance that can be moved through the full range of motion of an exercise for no more than one repetition. To determine the 1 RM, each subject initially performed 3 to 5 repetitions with the lightest weight possible to be sure proper technique is used. The investigator then selected a weight and asked the subject to perform the lift. Following 3 to 4 minutes of rest, the next heaviest weight was selected and the attempt was repeated until the subject could not complete the full lift. In each case, the investigator attempted to determine the 1 RM with 6 to 7 trials to prevent localized muscle fatigue. Training was set at approximately 80% of 1 RM. The same number of trials, time between trials and order of exercises was used before and after training for the 1-RM test. Tests were administered prior to the start of the training program and twice per month for the first two months (because of the anticipated rapid increase in strength) and once per month thereafter. The following exercises were evaluated for 1 RM's: leg press, leg extension, chest press, military press, and seated rows.

(c) <u>Control Group</u>

The attention control group met as frequently in a group as the exercise intervention groups at the University of Vermont. They were strongly encouraged to maintain their current level of physical activity and not to engage in any form of endurance or resistance exercise. They received similar dietary instruction and social support as the exercise intervention groups. They participated in all testing and weight stabilization. Following the completion of the study, these women were provided personalized exercise prescriptions for endurance and resistance training programs.

(2) ENERGY EXPENDITURE

(a) Doubly labeled water (DLW)

To determine the effects of endurance and resistance training on **changes** in daily energy expenditure and physical activity, energy expenditure was measured during a 10-day period using DLW methodology (32). A baseline urine (10 ml) was collected and a mixed dose of DLW was orally administered the afternoon before the first test visit. The doses were approximately 0.24g of $H_2{}^{18}O$ and 0.22g of ^2H_2O per kg of estimated total body water. The dose described has been selected to achieve initial and final enrichments that translate, by propagation of error analysis to a theoretical uncertainty in carbon dioxide production rates arising from analytical error of less than 5% (32).

Two urine samples were collected on the morning after dosing, and another two were collected on a return visit 10 days later. Samples are being analyzed in triplicate for $H_2{}^{18}O$ and ^2H_2O enrichments by isotope ratio mass spectrometry at the Biomedical Mass Spectrometry Facility in the Department of Medicine at the University of Vermont using the CO_2 equilibration technique (36), and the off-line zinc reduction method (37). Total daily energy expenditure is calculated from doubly labeled water data using equation A6 of Schoeller et al (38). **This technique will provide new information on whether physical activity levels (outside of the exercise programs) change in response to the endurance and resistance exercise programs.**

(b) Resting Metabolic Rate (RMR)

RMR was assessed after an overnight fast in which volunteers stayed overnight. RMR was measured for each subject by indirect calorimetry for 60 min, using the ventilated hood technique (39), following an overnight, 12-hour fast. RMR was specifically measured on the first day of urine collections for the doubly labeled water. Respiratory gas analysis was performed using a Deltatrac metabolic cart (Sensormedics, Yorba Linda, CA). Energy expenditure was calculated from the equation of Weir (40). The intraclass correlation and coefficient of variation (CV) for RMR determined using test-retest in 17 volunteers is 0.90 and 4.3%, respectively. The respiratory quotient (RQ) was calculated from indirect calorimetry. Test-retest correlation coefficients for respiratory quotients are 0.91 in our laboratory. **This measurement provides information on whether resting energy requirements change in response to endurance and resistance exercise.**

(c) Physical Activity Energy Expenditure

Doubly labeled water in conjunction with indirect calorimetry was used to measure PAEE. The energy expenditure of physical activity was derived by subtracting RMR, and an estimate for the thermic effect of a meal from total daily energy expenditure, PAEE = TEE - (RMR + TEM) (32). A fixed constant of 10% of daily energy expenditure for the thermic response to feeding was assumed (41). We have chosen not to directly measure the thermic effect of a meal because: 1) its contribution to total daily energy expenditure is small (10% of total daily energy expenditure) (42) and 2) postprandial measurements are long (4 to 6 hr) and of questionable reproducibility (43) and 3) the measurement of postprandial energy expenditure would significantly increase the time commitment for the women. **The change in the level of physical activity is a primary outcome variable because of its large contribution to daily energy expenditure and its relationship to changes in body composition.**

(d) Maximal Aerobic Power (VO_2 max)

VO_2 max was assessed by a progressive and continuous test to volitional exhaustion on a treadmill. After an initial 3-minute warm-up, the speed was held constant and the grade was increased by 2.5% every 2 minutes. VO_2 max was considered to have been achieved if two of the following criteria are met: 1) a plateau of VO_2 when the increase in oxygen consumption during the last minute of the VO_2 max test is <200 ml; 2) a respiratory exchange ratio greater than 1.1; or 3) a heart rate at or above the age-related predicted maximum (220 - age, yr). At least all volunteers met two of these criteria. Test-retest conditions (within 1 week) for VO_2 max for 20 volunteers have yielded an intraclass correlation of 0.94. If these criteria were not met, we requested that the volunteer perform another test of VO_2max. VO_2 max was assessed every two months to take into account the increases in maximal aerobic power so that exercise prescriptions can be re-evaluated to maintain the desired exercise intensity.

(e) Estimated energy intake

Self-recorded energy intake was measured for seven days during the doubly labeled water measurement period. Briefly, volunteers were provided with record sheets and dietary scales including procedures for reporting intake, estimation of portions, and describing food combinations. The energy content from food diaries will provide a more accurate estimate of food quotient necessary in the calculation from doubly labeled water.

(3) BODY COMPOSITION AND BODY FAT DISTRIBUTION

(a) Dual Energy x-ray Absorptiometry (DEXA)

DEXA uses the exponential attenuation due to absorption by body tissues of photons emitted at two energy levels (40 and 70 keV) to resolve body weight into bone mineral, and lean and fat soft tissue masses. The subject lays supine on a padded table. All metal objects are removed. The total dose for a scan is less than 1mSv. A total body scan takes about 30 minutes and provides estimates of the following: bone mineral densities (BMD, g/cm^2), soft-tissue attenuations ratios (Rst-values), fat and lean tissue weights (g), and percent body fat for 9 body regions, as well as total body fat weight, %body fat, fat-free mass and total body mineral weight. The reproducibility for body fat is 1.7% in test-retest conditions in six females. **This technique provides information on whether fat mass, fat-free mass and bone density changes in response to endurance and resistance exercise.**

(b) Computerized Tomography (CT)

CT scans are performed on a Siemens Somatom DRH scanner (Erlangen, FRG) using the procedures of Sjostrom et al (44). Briefly, women are examined in the supine position with both arms stretched above their head and single 5 mm, 2 second scans are taken at the abdomen at the level of the umbilicus and the mid-thigh level halfway between the greater trochanter and superior aspect of the patella and greater trochanter. Based on our evaluation of mean attenuation and intersection of adipose muscle tissues of over 400 cross-sections of intra-abdominal adipose tissue, a range of -190 to -30 Hounsfield units (HU) is used to measure cross-sectional area of adipose tissue and 30-80 HU for muscle tissue. Intra-abdominal and subcutaneous fat areas (expressed in cm^2) are measured using an automated computer program, which outlines fat with the HU range selected. The coefficient of variation for repeat cross-section analysis of scans among 40 women is less than 2% for adipose tissue. **The technique will provide information on whether the quantity of visceral fat changes in response to resistance and endurance exercise.**

(4) INSULIN SENSITIVITY

The hyperinsulinemic/euglycemic clamp was used to measure sensitivity to insulin (23). Women had an intravenous catheter placed in a large antecubital vein for infusion (20% dextrose) and another placed in a retrograde fashion into a dorsal vein with the hand kept in a warming box at 70^0C to arterialize venous effluent. Blood samples are drawn from the dorsal hand vein for glucose and insulin determination (every 5 min). Plasma glucose levels are measured (Beckman Instruments, Fullerton, CA) and the rate of glucose infusion adjusted every 5 minutes to maintain the desired level of glycemia. Insulin concentrations were measured by radioimmunoassay in all samples from an individual (baseline, and post-intervention) in a single assay to minimize interassay variation.

The amount of glucose utilized is an index of insulin sensitivity. **This technique will provide new information on changes in insulin sensitivity in response to endurance and resistance exercise in military-eligible women.**

(4) FAT METABOLISM

(a) ^{13}C-palmitate kinetics

Basal rates of lipolysis and whole body fat oxidation were assessed as previously described (26). Briefly, a non-primed constant infusion of [1-^{13}C]palmitic acid was administered for 120 min in the post-absorptive state with simultaneous measurement of resting metabolic rate with indirect calorimetry. Samples for determination of the enrichment of the specific activity of palmitic acid will be taken prior to and at 90, 100, 110, and 120 min after the start of the infusion.

The calculations were made using the following equations:

i. The rate of appearance of palmitic acid (R_{aP}) with the following formula:

$$R_{aP}\ (\mu mol/kg/min) = IR / IE$$

Where, **IR** is the infusion rate of tracer (μmol/kg/min) and **IE** is the enrichment of substrate in plasma at isotopic equilibrium.

ii. The rate of appearance of free fatty acids (R_{aFFA}) with the following formula:

$$R_{aFFA}\ (\mu mol/kg/min) = R_{aP}\ (C_{FFA}/C_P)$$

Where, $\mathbf{C_{FFA}}$ is a concentration of free fatty acids in the blood measured by colorometric assay using kit from Biochemical Diagnostics (Brentwood, NY) and $\mathbf{C_P}$ is the concentration of plasma palmitate measured by gas chromatography-mass spectrometry.

iii. The rate of oxidative disposal (FFA_{ox}) of serum fatty acids was measured by indirect calorimetry. The rate of fat oxidation (FAT_{ox}) is obtained by dividing fat oxidation calculated with indirect calorimetry by 860 (molecular weight of a typical triglyceride), and multiplying it times three (three fatty acids per mole of triglyceride).

iv. The rate of non-oxidative disposal (FFA_{NOX}) of serum fatty acids (extra cellular recycling of fatty acids by the following formula:

$$FFA_{NOX} = R_{aFFA} - FFA_{OX}$$

The coefficient of variation for test-retest measurements is 13% and the intra-class correlation is 0.95 for ten older individuals tested two weeks apart. **This technique will provide information on changes in fatty acid appearance and fat oxidation in response to endurance and resistance exercise programs in military eligible women.**

(5) SAMPLE SIZE CALCULATIONS and DATA ANALYSIS

(1) Sample Size Calculations

We have calculated sample sizes based on hypothesized changes within the endurance and resistance treatment conditions. We present power calculations for hypothesized changes in two variables: 1) total daily energy expenditure and 2) insulin sensitivity. Our sample size calculations are for an alpha level of 0.05 with 80% power. Our recruiting and sample size goals were finally based on the changes anticipated with insulin sensitivity because of the larger sample size required.

We hypothesized that the total daily energy expenditure will be increased by 360 kcal/d for both endurance and resistance training with a standard deviation of 200 kcal/d in women. This increase takes into account the 10% increase in resting metabolic rate (160 kcal/d) (30) and the hypothesized increase of 200 kcal/d in free-living physical activity. We anticipate that endurance exercise will increase physical activity during non-exercising time because: 1) the loss of fat mass will reduce the burden of carrying extra weight and 2) daily physical activities will be performed at a lower percentage of VO_2max. We anticipate that resistance training will increase fat-free mass by 2-3 kg. Data from our laboratory shows that for each 1 kg increase in fat-free mass, resting metabolic rate increases by approximately 50 kcal/d (42). This would translate into a 150-160 increase in resting metabolic rate per day. Again, given the increase in fat-free mass, we anticipate that women will be more physically active and expend approximately 200 kcal/d more per day in their non-exercising time. Thus, we hypothesize that total daily energy expenditure will be increased by an extra 360 kcal/d with a standard deviation of 200 kcal/d (32).

We have also performed power analyses on changes in insulin sensitivity. We estimated that setting the power at 0.80 and a significance level at 0.05, in order to detect a difference in glucose utilization 0.4 mg/kg fat free-mass/min. This preliminary data from our laboratory is based on 0.8 mg/kg fat-free mass change in glucose utilization in 10 endurance trained individuals who trained for 6 months and a 0.4 mg/kg fat-free mass change in 12 older individuals who lost 4 kg after 6 months and with a standard deviation of 1.1 and 1.3 mg, respectively. We will need 85 subjects or 28 women per group (resistance, endurance and control). With a 20% dropout rate, we will need to recruit 104 women over the four-year grant period. Because the sample size calculations for this variable yielded the greatest number of subjects to be recruited, we have based our recruiting and sample size calculations on the change in insulin sensitivity.

STATISTICAL ANALYSIS:

Analysis: A repeated measures analysis of variance will be used to detect changes with time within the treatment condition and among groups (endurance vs. resistance vs. control). The repeated measures factor will be the repeated tests during the exercise programs.

This analysis will provide information on whether total daily energy expenditure, resting metabolic rate, physical activity, fat metabolism and intra-abdominal body fat and insulin sensitivity change in response to and among treatment conditions. Changes in the dependent variables will be analyzed on an absolute as well as relative (%) basis.

RESULTS:

See attached paper in Appendix II and III.

DISCUSSION:

We conclude that our randomization procedure has been successful, as there were not any statistically significant differences among the groups at pre-testing in any of the physical characteristic variables. Moreover, the study is complete. The dropout rate is ~32% (31 volunteers), which is slightly higher than we have anticipated (20%). The major reason for dropouts has been non-compliance with the training protocol (16 volunteers). That is, the volunteers' participation in the training was below an acceptable level (80%), typically due to conflicts with their other commitments. Furthermore, 5 volunteers dropped out because of an injury (knee pains, ankle pains). This is to be expected, because only previously sedentary women are accepted for participation. Some of the other reasons included relocation (3 volunteers), refusal to return for post-testing (2 volunteers), health problems not related to training (3 volunteers), and pregnancy (2 volunteers). To decrease our dropout rate, we adopted a strategy of very detailed discussions with each prospective volunteer (by two different members of our team) during the initial contact over the phone as well as during the screening visit. On both occasions, we thoroughly describe and stress the time commitment necessary for their successful participation in the study. This approach has proven successful, during the last year and we have observed a substantially lower dropout rate.

The analysis of the pre- and post-intervention data supported the anticipated effect of our exercise training interventions. The increases in peak oxygen consumption as well as maximum strength and fat-free mass are in accordance with the results of similar exercise intervention studies.

RECOMMENDATIONS:

Recommendations at this time include that a continuous program involving resistance and/or endurance training shows significant improvements in glucose disposal in young women with normal body weight. This type of training also has a long-term effect on preventing the onset of type 2 diabetes, hypertension and cardiovascular disease. Each volunteer who has completed this study has seen significant results in their overall health. It has been recommended to them to continue a similar program on their own to further maintain a healthy lifestyle.

KEY RESEARCH ACCOMPLISHMENTS:

- Women with a BMI <26 but with a body fat percentage 30% are at a higher risk for impaired insulin sensitivity, which will potentially promote an early onset of type 2 diabetes, hypertension, and CVD.
- Young non-obese women with both high percentages of subcutaneous and visceral abdominal fat accumulation are at higher risk for impaired insulin sensitivity.
- Recent data has shown that obesity-related phenotypes are present in apparently healthy, young women with normal body weight.
- Major findings include that resistance and endurance training improve glucose disposal, which could prevent the onset of metabolic deterioration, type 2 diabetes, and obesity.
- The volume of physical activity preformed in the present study may be more beneficial in preventing increases in total regional fat with advancing age, rather than promoting fat loss.
- Endurance and resistance training does not chronically alter total energy expenditure in free-living young women.

- Energy enhancing benefits of exercise training are primarily derived from the direct energy cost of exercise and not from a chronic elevation in daily energy expenditure in young, non-obese, women.

REPORTABLE OUTCOMES:

Through the course of working on this project, three papers have been submitted for publication. "Phenotypic Characteristics Associated With Insulin Resistance in Metabolically Obese but Normal Weight Young Women," written by, Roman V. Dvorak, Walter F DeNino, Philip A. Ades and Eric T. Poehlman is located in Appendix I. "Effects of Resistance Training and Endurance Training on Insulin Sensitivity in Non-obese, Young Women: A Controlled Randomized Trial," authors, Eic T. Poehlman, Roman V. Dvorak, Walter F. DeNino, Martin Brochu, and Philip A. Ades is located in Appendix II. " Effects of Endurance Training and Resistance Training on Total Daily Energy Expenditure in Young Women: A Controlled Randomized Trial," authors, Eric T. Poehlman, Walter F. DeNino, Travis Beckett, Kristen A. Kinaman, Isabelle J. Dionne, Roman V. Dvorak, Philip A. Ades is located in appendix III. In addition, a strong database of 58 volunteers has been generated from this study. This database will allow us to compare information in this study with current findings in our line of research. A current copy of the database presented in the Stat View program, is located in Appendix IV.

This grant has provided the University of Vermont with several employment and research opportunities. The Department of Medicine has developed a strong relationship with Racquet's Edge Health and Fitness Center, which has a direct effect on the community. Racquet's Edge is the leader among fitness clubs in this area and will be a strong link for the University of Vermont research department to the community. Employment opportunities from this project have been significant. Dr. Roman Dvorak worked on this project since the beginning. It has given him the opportunity to become independent with his own research and complete his post-doctoral degree here at the University of Vermont. Moreover, Travis Beckett and Kristen Kinaman have had the opportunity to personal train the volunteers as well as help to coordinate scheduling and assist in research for this project. Sarah Goodrich has also helped in training the volunteers at the Racquet's Edge furthering her career in research.

CONCLUSIONS:

We are very pleased with the progress of this study. We were able to recruit a substantial cohort of young women and the composition of all three groups follows the inclusion criteria as outlined above. Moreover, absence of significant difference among the groups at the pre-testing in age, weight, body mass index and peak oxygen consumption indicates that our randomization procedure works as anticipated. We have been receiving positive feedback from volunteers in the exercise training groups. Furthermore, the analysis of pre-versus post-exercise intervention data has shown that our exercise training intervention induced the anticipated effects with respect to peak oxygen consumption, maximum strength, and fat-free mass.

In summary, both endurance and resistance training are effective interventions to enhance insulin sensitivity, despite minimal changes in body composition. On the other hand, increases in VO_2 max by endurance training or by strength training does not increase total daily energy expenditure or physical activity outside of the exercise programs. We would suggest that additional physical activity counseling may be necessary to augment free-living physical activity levels outside the exercise programs. Endurance and resistance training improve cardiovascular risk profiles in young women.

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APPENDIX I

Phenotypic Characteristics Associated With Insulin Resistance in Metabolically Obese but Normal-Weight Young Women

Roman V. Dvorak, Walter F. DeNino, Philip A. Ades, and Eric T. Poehlman

Metabolically obese, normal-weight (MONW) individuals are a hypothesized subgroup of the general population. These normal-weight individuals potentially display a cluster of obesity-related features, although this has not been systematically tested in young women. We hypothesized that MONW young women would display higher levels of total and visceral fat and lower levels of physical activity than normal women. In a cohort of 71 healthy nonobese women (21–35 years old), we identified MONW women based on cut points for insulin sensitivity (normal = glucose disposal >8 mg · min^{-1} · kg^{-1} of fat-free mass [FFM], *n* = 58; impaired = glucose disposal <8 ml · min^{-1} · kg^{-1} of FFM, *n* = 13). Thereafter, we measured body composition (dual energy X-ray absorptiometry) and body fat distribution (computed tomography), cardiorespiratory fitness (Vo_{2max} on a treadmill), physical activity energy expenditure (doubly labeled water and indirect calorimetry), glucose tolerance (oral glucose tolerance test), serum lipid profile, and dietary intake. We found a higher body fat percentage (32 ± 6 vs. 27 ± 6%, *P* = 0.01) and higher subcutaneous (213 ± 61 vs. 160 ± 78 cm^2, *P* = 0.03) and visceral (44 ± 16 vs. 35 ± 14 cm^2, *P* < 0.05) abdominal adiposity in the MONW group versus the normal group. The MONW group showed a lower physical activity energy expenditure (2.66 ± 0.92 vs. 4.39 ± 1.50 MJ/day, *P* = 0.01), but no difference in cardiorespiratory fitness was noted between groups. In conclusion, despite a normal body weight, a subset of young, apparently healthy women displayed a cluster of risky phenotypic characteristics that, if left untreated, may eventually predispose them to type 2 diabetes and cardiovascular disease. *Diabetes* 48:2210–2214, 1999

The existence of a subgroup of individuals who have normal body weight but display a cluster of obesity-related phenotypic characteristics was first proposed in the 1980s (1). Since this discussion, an accumulating body of evidence suggests a high prevalence of these individuals in the general population (2,3). These metabolically obese, normal-weight (MONW) individuals display early signs of insulin resistance, hyperinsulinemia, and dyslipidemia, despite having a normal weight based on traditional criteria (e.g., BMI, height/weight tables, etc.) (2). The presence of these metabolic and cardiovascular disease (CVD) risk factors may go undetected for years because young age, sex, and normal body weight mask the need for early detection and treatment. To our knowledge, however, the existence and prevalence of this syndrome in young women has not been systematically investigated. Moreover, the phenotypic characteristics that may be associated with the MONW syndrome in young women are unknown.

To this end, we identified MONW individuals (characterized by impaired insulin sensitivity) in a representative cohort of young nonobese women. Second, we compared the phenotypic characteristics implicated in the pathogenesis of insulin resistance between MONW and normal women. We hypothesized that MONW women would display higher levels of total and visceral adiposity and lower levels of cardiorespiratory fitness and physical activity than women with normal insulin sensitivity.

RESEARCH DESIGN AND METHODS

Patients. There were 71 young normal-weight women (67 of Caucasian, 2 of Asian, and 2 of Hispanic origin) who participated in the study. The inclusion criteria for participation were *1*) age 18–35 years, *2*) BMI ≤26, *3*) weight stable (±2 kg) over 6 months preceding the study, and *4*) no regular participation in exercise for 6 months before the study. Exclusion criteria for participation were *1*) smoking, *2*) acute illness, *3*) receiving any medication affecting energy expenditure (e.g., β-blockers), and *4*) alcohol consumption >15 g of alcohol/day. The presence or absence of a family history of diabetes was obtained during the physical examination. Because participants in our study were young women (<35 years old), parental age may have limited the detection of type 2 diabetes. Thus, we also considered the presence of type 2 diabetes among grandparents and the siblings of parents as indicators of a positive family history. The use of oral contraceptives was also obtained from the medical history. This study was approved by the Committee for Human Research at the University of Vermont and each participant gave written informed consent before the beginning of the study.

Overview of protocol. Each participant was first invited to a screening visit during which an oral glucose tolerance test (OGTT), medical history, physical examination, maximum oxygen consumption test, and complete blood chemistry and profile were performed. Two weeks later, participants were invited for an overnight visit to the General Clinical Research Center (GCRC) at the University of Vermont. For 3 days before the overnight visit, participants were provided with standardized diets prepared by the metabolic kitchen at the GCRC, containing 55% carbohydrates, 25% fat, and 20% protein. During the afternoon of admission, we administered doubly labeled water and conducted body composition and body fat distribution measurements. The following morning, the hyperinsulinemic-euglycemic clamp was performed. Subjects returned to the GCRC 10 days later to provide the final two urine samples to conclude the doubly labeled water measurement.

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CVD, cardiovascular disease; FFM, fat-free mass; GCRC, General Clinical Research Center; MONW, metabolically obese, normal-weight; OGTT, oral glucose tolerance test; PAEE, physical activity energy expenditure; RMR, resting metabolic rate; TEE, total daily energy expenditure.

Measurements

Glucose tolerance. An OGTT was performed in the morning after an overnight fast. A Teflon catheter was placed into an antecubital vein, and baseline samples for the measurement of insulinemia and glycemia were drawn. Thereafter, a standard glucose load (1.33 g/kg of body mass) was given orally (Ensure Plus; Ross Laboratories, Columbus, OH). Samples for repeated measurement of glycemia and insulinemia were then taken 120 min after baseline.

Body composition. We measured body composition by dual energy X-ray absorptiometry (Lunar DPX-L, Madison, WI), as previously described (4). The subjects were instructed to lay supine on a padded table with all metal objects removed. A total body scan takes ~30 min. This method uses a three-compartment model of body composition and provides an estimate of fat mass, fat-free mass (FFM), and bone mineral density. We analyzed all scans by the Lunar DPX-L extended analysis software, version 1.3. The test-retest reproducibility for body fat is 1.7% (six females) in our laboratory.

Body fat distribution. We measured body fat distribution by computed tomography (CT) using a General Electric High Speed Advantage CT Scanner (GE Medical Systems, Milwaukee, WI), as previously suggested by Sjostrom et al. (5) and reported by our laboratory (6). Visceral and subcutaneous abdominal fat accumulation was assessed at the level of L_4-L_5 intervertebral space. Scan position for the abdominal level was established using a scout view, positioning the scanner within the desired intervertebral space. The scans were 5 mm in thickness and performed at 120 kV and 220 mA. Visceral and subcutaneous adiposity was quantified by delineating the visceral cavity using the trace function and excluding the retroperitoneal area. The boundary was established at the innermost aspects of the abdominal and oblique muscle walls. Subcutaneous adipose tissue was selected as the area remaining between the visceral boundary and the skin. Retroperitoneal fat was excluded from both the subcutaneous and visceral adipose tissue areas. Adipose tissue was selected by the software at an attenuation range of –190 to –30 Hounsfield units. The visceral cavity was assessed using the "mask" function and then the subcutaneous area using the "contour" feature. The same individual analyzed all scans, and the interclass correlation for repeated analysis of 10 scans was 0.99 in 10 women.

Cardiorespiratory fitness. Maximum aerobic capacity (Vo_{2max}) was determined from an incremental exercise test on a treadmill to exhaustion, as previously described (7). After an initial 3-min warm-up, the speed was set so that the heart rate would not exceed 70% of the age-predicted maximum heart rate [220 – age (years)]. Thereafter, the speed was held constant, and the grade was increased by 2.5% every 2 min. The criteria for achieving a Vo_{2max} were *1*) a respiratory exchange ratio >1.0, *2*) a heart rate at or above the age-predicted maximum, and *3*) no further increase in oxygen consumption with an increasing workload. At least two of these criteria were reached by all volunteers. Test-retest conditions for nine individuals (on two occasions tested 1 week apart) yielded an intraclass correlation of 0.94 and a coefficient of variation of 3.8% in our laboratory.

Physical activity energy expenditure. We used doubly labeled water in combination with indirect calorimetry to measure free-living physical activity energy expenditure (PAEE). Total daily energy expenditure (TEE) was determined over a 10-day period. Each subject was dosed with a 1 g/kg body mass of $^2H_2{}^{18}O$ using the method of Schoeller and van Santen (8), as previously described (9). Briefly, a baseline urine sample was collected before dosing. The following morning, two additional urine samples were collected, and two more samples were collected 10 days later. Urine samples were stored frozen in vacutainers at –20°C until analyzed for ^2H and ^{18}O enrichments by isotope ratio mass spectrometry. ^{18}O isotopic enrichment was determined from the carbon dioxide (CO_2) equilibration technique, and ^2H enrichment was determined by the zinc catalyst method (10). Daily rate of CO_2 production (mol/day) was calculated using the equation of Speakman et al. (11): $rCO_2 = N/2.196 \times (^cO^kO - {}^cH^kH)$, where N is the total body water pool, ^kO and ^kH are the elimination rates of ^{18}O and ^2H tracers from the body, and ^cO and ^cH are the dilution spaces for ^{18}O and ^2H tracers, as recommended by Racette et al. (12). Assuming a respiratory quotient of 0.85 for the food consumed (13), total CO_2 production was converted to TEE (kJ/day) using the formula by Weir (14).

Resting metabolic rate (RMR) was determined from 45 min of indirect calorimetry using the ventilated hood technique, as previously described (15). Respiratory gas analysis was performed using a Deltatrac metabolic cart (Sensormedics, Yorba Linda, CA). RMR (kJ/day) was calculated from the equation by Weir (14). Assuming a thermic effect of feeding of 10% (16), total PAEE was then calculated from the equation: PAEE = [(TEE × 0.90) – RMR]. That is, PAEE represents the energy expenditure accumulated above basal levels, which include volitional and nonvolitional activities. We have previously reported an intraclass correlation of 0.90 and a coefficient of variation of 4.3% for the measurement of RMR in 17 older volunteers from two different occasions tested 1 week apart.

Insulin sensitivity. We measured insulin sensitivity by the hyperinsulinemic-euglycemic clamp technique, as proposed by DeFronzo et al. (17). Briefly, a Teflon catheter was inserted into the antecubital vein for the infusions of insulin and dextrose. Another Teflon catheter was retrogradely placed into the dorsal vein of the contralateral hand and used for the blood draws during the clamp procedure. This hand was placed in a "hot box" and warmed to 70°C for arterialization of blood. At time 0 min, a continuous infusion of insulin was started at a constant rate of 240 pmol · m^{-2} · min^{-1}. At the same time, a variable infusion of 20% dextrose was started to maintain fasting glycemia ±5%. Blood samples for glucose measurement were taken every 5 minutes for insulin measurements at –30, –10, 0, 30, 60, 70, 90, 105, and 120 min of the clamp. The insulin levels attained during the last 30 min of the clamp (minute 90–120) were 75 ± 23 μU/ml (mean ± SD). Insulin-stimulated glucose disposal rate (*M* value) was calculated as the average glucose infusion rate (mg/min) during the last 30 min of the 120-min clamp, adjusted for the total distribution volume of glucose (250 ml/kg). Hepatic glucose production has previously been shown to be fully suppressed, with the insulin dose used in our study to induce hyperinsulinemia (18).

Dietary intake. Dietary intake was measured for 3 days (one weekend and two weekdays), as previously described (19). Participants were instructed by a registered dietitian and encouraged to maintain their usual diet. Moreover, they were provided with dietary scales and measuring cups and spoons to further increase precision of obtained data. Diets were analyzed using the Nutritionist III software version 4.0 (N-Squared Computing, Salem, OR).

Blood pressure. Blood pressure was determined during the screening visit at the GCRC using a Dinamap automatic cuff machine (Critikon, Tampa, FL), as previously described (20). Subjects rested in the sitting position for 10 min and then the measurement was taken from their right arm. Appropriate cuff size was selected based on arm circumference.

Biochemical analyses. Plasma glucose concentrations were measured using the glucose oxidase method with an automated glucose analyzer (YSI Instruments, Yellow Springs, OH). Serum insulin was measured by a double antibody radioimmunoassay (Diagnostics Products, Los Angeles, CA). Plasma cholesterol, triglyceride, and HDL cholesterol concentrations were determined from standard enzymatic techniques at the Centers for Disease Control accredited laboratory of the Fletcher Allen Medical Center. Interassay coefficient of variation for the measurement of total and HDL cholesterol was 3.35 and 1.15%, respectively. LDL cholesterol was determined from the equation by Friedewald et al. (21).

Statistical analysis. To identify women classified as having impaired insulin sensitivity, we used a glucose disposal cut-point value of 8.0 mg · min^{-1} · kg^{-1} of FFM, based on previous data (22). Women with a glucose disposal rate greater than the cut-point value were classified as having normal insulin sensitivity and those women with values below the cut point as having impaired insulin sensitivity. The rationale for using glucose disposal as the criterion method to categorize individuals as normal or MONW is based on the notion that resistance to insulin-stimulated glucose uptake is suggested as a common pathogenic mechanism for type 2 diabetes, hypertension, and, ultimately, CVD (23,24). Differences in dependent variables between the groups (MONW vs. normal) were examined using an independent *t* test. Differences between groups in cardiorespiratory fitness were examined using analysis of covariance, with body weight as a covariate (7). Given the unequal sample size between groups, we examined the equality of variances in each variable using Levene's test. When the variances were unequal (HDL cholesterol and glucose disposal adjusted per kilogram of FFM), a *P* value based on Satterthwaite's (25) approximation for the degrees of freedom was used. A χ^2 test was used to compare the differences between the groups for the family history of diabetes and use of oral contraceptives. All values are reported as means ± SD. Significance was accepted at $P < 0.05$. Data were analyzed using the SPSS statistical software (Version 7.5.1, SPSS, Chicago).

RESULTS

Table 1 shows glucose disposal values and anthropometric variables for the normal and MONW groups. By design, the MONW women showed a lower absolute and adjusted (per kilogram of FFM) insulin-stimulated glucose disposal rate. The groups were similar with respect to age, BMI, body mass, FFM, and appendicular fat mass. Women classified as MONW, however, showed a greater total fat mass ($P < 0.05$), body fat percentage ($P = 0.01$), truncal fat ($P = 0.02$), and subcutaneous ($P < 0.05$) and visceral ($P < 0.05$) abdominal adiposity than women with normal insulin sensitivity.

We found no differences between groups in cardiorespiratory fitness on an absolute or adjusted basis (Table 2). On the other hand, we found a lower PAEE in the MONW women compared with normal women ($P < 0.001$, Table 2). No differences between groups were found for systolic or diastolic

TABLE 1
Comparison of glucose disposal and anthropometric variables between women with impaired (MONW) and normal insulin sensitivity

Variable value	MONW	Normal	P
n	13	58	—
Age (years)	29 ± 3	28 ± 4	0.97
Glucose disposal (mg/min)	250 ± 65	444 ± 112	0.001
Glucose disposal (mg · FFM^{-1} · min^{-1})	6.5 ± 1.7	11.0 ± 2.2	0.001
BMI (kg/m^2)	22.5 ± 2.0	21.5 ± 2.0	0.08
Body mass (kg)	60.1 ± 8.9	58.4 ± 6.9	0.42
FFM (kg)	38.9 ± 5.1	40.3 ± 4.0	0.28
Fat mass (kg)	18.4 ± 5.2	15.3 ± 4.4	0.03
Body fat (%)	31.8 ± 5.9	27.4 ± 5.5	0.01
Appendicular fat (kg)	8.9 ± 2.6	8.0 ± 2.3	0.23
Truncal fat (kg)	8.2 ± 2.6	6.5 ± 2.4	0.02
L_4-L_5 subcutaneous fat area (cm^2)	213 ± 61	160 ± 78	0.03
L_4-L_5 visceral fat area (cm^2)	44 ± 16	35 ± 14	0.046

Data are means ± SD. To identify women classified as having impaired insulin sensitivity, we used a glucose disposal cut-point value of 8.0 mg · min^{-1} · kg^{-1} of FFM, based on the data presented by Beck-Nielsen and Groop (22).

blood pressure, family history of diabetes, or the use of oral contraceptives (Table 2). Furthermore, we found no differences in total energy intake (8.28 vs. 8.32 MJ/day); percent intake of carbohydrate (53 vs. 56%), fat (33 vs. 30%), and protein (13 vs. 14%); and percent fat intake from saturated fat (36 vs. 34%) between the MONW and normal group, respectively.

In Table 3, we present the results of the OGTT and serum lipid profile. The MONW group showed a higher fasting (P = 0.03) and 2-h postload insulin (P < 0.001), 2-h postload glucose (P < 0.01), and total serum cholesterol (P < 0.01) than the normal group. We found no differences between groups in fasting serum glucose, HDL cholesterol, total–to–HDL cholesterol ratio, LDL cholesterol, or fasting triglycerides.

DISCUSSION

To our knowledge, this is the first study to comprehensively examine the phenotypic characteristics associated with the MONW syndrome in young women. Based on our approach, we found that 18% of our population was classified as having impaired insulin sensitivity, despite having normal body weight and BMI. Furthermore, young MONW women with impaired insulin sensitivity showed a cluster of risky phenotypic characteristics, including low PAEE and increased total and visceral adiposity.

The incidence of obesity and type 2 diabetes is increasing among women (26), which places them at high risk for the development of insulin resistance and associated comorbidities (27). Given that the deleterious consequences of compensatory hyperinsulinemia (i.e., microangiopathy, hypertension, and CVD) are present at the time of diagnosis of overt type 2 diabetes (28), a clear medical need exists to identify markers for early detection of these individuals before the onset of an established disease process.

We classified individuals above and below a glucose disposal cut point of 8 ml · min^{-1} · kg^{-1} of FFM. The use of glucose disposal to subdivide young women into normal and MONW groups is based on the notion that a decrease in insulin sensitivity may be a common pathogenic mechanism in the development of type 2 diabetes, hypertension, and CVD (23,24). Although this cut point may be considered somewhat arbitrary, women who were classified as having impaired insulin sensitivity (based on hyperinsulinemic-euglycemic clamp) also displayed an altered response to oral glucose load (Table 2). Furthermore, the chosen cut point was based on previous multicenter data (22) that examined insulin sensitivity data from a large sample of individuals. We were somewhat surprised that 18% (n = 13) was categorized as having impaired insulin sensitivity. This finding supports the hypothesis by Ruderman et al. (2) regarding the relatively high prevalence of individuals with impaired insulin sensitivity in apparently healthy normal-weight individuals. This finding prompted us to examine several obesity-related phenotypic characteristics that have been implicated in the development of impaired insulin sensitivity.

In the present study, we found that women with impaired insulin sensitivity were characterized by a higher body fat percentage and fat mass than women with normal insulin sensitivity, despite no difference in body mass or BMI between groups. This suggests that even small increases in body fatness (2–3 kg) within a normal range of BMI negatively affect insulin sensitivity. Indeed, in our cohort, the incidence of impaired insulin sensitivity reached almost 40% among women with a body fat percentage >30%. Therefore,

TABLE 2
Comparison of cardiorespiratory fitness, PAEE, blood pressure, oral contraceptives, and incidence of family history of diabetes between women with impaired (MONW) and normal insulin sensitivity

Variable	MONW	Normal	P value
n	13	58	—
$\dot{V}O_{2max}$ (ml/min)	2,228 ± 509	2,297 ± 426	0.61
Adjusted $\dot{V}O_{2max}$ (ml/min)*	2,197 ± 396	2,304 ± 395	0.38
PAEE (MJ/day) (n)	2.66 ± 0.92 (9)	4.39 ± 1.50 (41)	0.01
Systolic blood pressure (mmHg)	118 ± 12	118 ± 14	0.99
Diastolic blood pressure (mmHg)	69 ± 8	68 ± 10	0.73
Family history of diabetes (%) (yes/no)	31 (4/9)	32 (14/44)	0.53
Use of oral contraceptives (%) (yes/no)	60 (8/5)	47 (27/31)	0.33

Data are means ± SD or %. *Adjusted for kilogram of body weight, as previously described (7).

TABLE 3
Comparison of OGTT and blood lipid values between women with impaired (MONW) and normal insulin sensitivity

Variable	MONW	Normal	*P* value
n	13	58	—
Fasting glucose (mmol/l)	4.4 ± 0.4	4.4 ± 0.3	0.80
2-h postload glucose (mmol/l)	5.7 ± 1.1	4.6 ± 1.1	0.003
Fasting insulin (pmol/l)	60 ± 20	49 ± 15	0.03
2-h postload insulin (pmol/l)	481 ± 259	281 ± 186	0.001
Total cholesterol (mmol/l)	5.3 ± 0.9	4.5 ± 0.7	0.003
HDL cholesterol (mmol/l)	1.7 ± 0.5	1.5 ± 0.3	0.15
Total-to-HDL cholesterol	3.3 ± 0.9	3.3 ± 0.8	0.91
LDL cholesterol (mmol/l)	3.1 ± 0.9	2.7 ± 0.8	0.14
Triglycerides (mmol/l)	2.4 ± 0.7	2.4 ± 1.0	0.93

Data are means ± SD.

we suggest that young women with a BMI <26 but with a body fat percentage >30% are probably at a higher risk for impaired insulin sensitivity and a potentially early onset of type 2 diabetes, hypertension, and CVD. Our findings thus support the notion that BMI is a poor marker to identify women at risk for the development of insulin resistance and associated comorbidities.

The question as to whether body fat topography is "pathogenic" with respect to insulin sensitivity and type 2 diabetes is controversial (29). For example, some investigators found that abdominal subcutaneous adiposity is a stronger predictor of insulin sensitivity than visceral adiposity in middle-aged men and women (30) and in pre-menopausal women (31). On the other hand, others (32,33) reported that visceral adiposity is the stronger determinant of insulin sensitivity in obese women. In the present investigation, young women with impaired insulin sensitivity showed significantly higher subcutaneous as well as visceral abdominal fat accumulation than women with normal insulin sensitivity. Despite the fact that the levels of visceral fat accumulation in the MONW group were well below the suggested critical threshold of 130 cm^2 (34), it is possible that even relatively low levels of visceral adiposity in the presence of higher levels of total body fatness have a deleterious impact on insulin sensitivity. Nonetheless, our findings suggest that in young nonobese women, both subcutaneous and visceral abdominal fat accumulation may be associated with impaired insulin sensitivity.

Physical inactivity (35) and low cardiorespiratory fitness (36) have been implicated as important risk factors in the pathogenesis of type 2 diabetes. We found no differences in cardiorespiratory fitness between groups. This may be because only sedentary women were recruited for the study and thus limited our ability to find differences between the groups. On the other hand, we noted a significantly lower PAEE in the MONW group. To our knowledge, this is the first study that used a direct measurement of PAEE by the doubly labeled water methodology in the examination of risk factors for insulin resistance and CVD in free-living individuals. Previous investigations have reported an inverse relationship between physical activity and incidence of type 2 diabetes (37); however, physical activity levels were only estimated from a self-reported questionnaire, which has been shown to be inaccurate (38). These results suggest that PAEE, and not cardiorespiratory fitness, may be a more important predictor of impaired insulin sensitivity. We would suggest that PAEE probably influences insulin sensitivity and other CVD risk factors primarily through its effects on energy balance and body composition (39). That is, lower levels of PAEE found in the MONW group may favor a positive energy balance, especially because total daily energy intake was similar between the groups. Thus, low levels of PAEE may favor a greater increase in total and central adiposity in susceptible individuals (40).

Despite differences in other phenotypic characteristics between the MONW and normal groups, no differences were found in the total-to-HDL cholesterol ratio, fasting triglycerides, and LDL cholesterol. The cardioprotective effects of estrogen on plasma lipids has been well documented (41). Thus, it is possible that the presence of estrogen in these young women may exert a stronger influence on plasma lipids than differences in physical activity and adiposity.

Our results have clinical implications for the detection and treatment of susceptible individuals for type 2 diabetes and CVD. The phenotypic features associated with impaired insulin sensitivity (increased body adiposity and low levels of physical activity) are generally responsive to lifestyle modifications such as dietary restriction and aerobic exercise training (39,42). Therefore, identification and early treatment of these individuals, particularly at younger ages before metabolic diseases become overt and established, would have a substantial public health value. It needs to be emphasized, however, that our cross-sectional study cannot establish a causative relationship. Further studies using exercise, dietary, or pharmacological interventions are needed to evaluate whether the metabolic profile of MONW individuals can be normalized.

In conclusion, we found that despite a normal body weight, a subset of young, apparently healthy women displayed a cluster of risky phenotypic characteristics that may eventually predispose them to type 2 diabetes and CVD.

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APPENDIX II

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Effects of Resistance Training and Endurance Training on Insulin Sensitivity in Nonobese, Young Women: A Controlled Randomized Trial*

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ABSTRACT

We examined the effects of a 6-month randomized program of endurance training (n = 14), resistance training (n = 17), or control conditions (n = 20) on insulin sensitivity in nonobese, younger women (18–35 yr). To examine the possible mechanism(s) related to alterations in insulin sensitivity, we measured body composition, regional adiposity, and skeletal muscle characteristics with computed tomography. We observed no changes in total body fat, sc abdominal adipose tissue, or visceral adipose tissue with endurance or resistance training. Insulin sensitivity, however, increased with endurance training (pre, 421 ± 107; post, 490 ± 133 mg/min; $P < 0.05$) and resistance training (pre, 382 ± 87; post, 417 ± 89 mg/min; $P = 0.06$). When the glucose disposal rate was expressed per kg fat-free mass (FFM), the improved insulin sensitivity persisted in endurance-trained (pre, 10.5 ± 2.7; post, 12.1 ± 3.3 mg/min·kg FFM; $P < 0.05$), but not in resistance-trained (pre, 9.7 ± 1.9; post, 10.2 ± 1.8 mg/min·kg FFM; P = NS) women. Muscle attenuation ratios increased ($P < 0.05$) in both endurance- and resistance-trained individuals, but this was not related to changes in insulin sensitivity. Moreover, the change in insulin sensitivity was not related to the increased maximum aerobic capacity in endurance-trained women ($r = 0.24$; P = NS). We suggest that both endurance and resistance training improve glucose disposal, although by different mechanisms, in young women. An increase in the amount of FFM from resistance training contributes to increased glucose disposal probably from a mass effect, without altering the intrinsic capacity of the muscle to respond to insulin. On the other hand, endurance training enhances glucose disposal independent of changes in FFM or maximum aerobic capacity, suggestive of an intrinsic change in the muscle to metabolize glucose. We conclude that enhanced glucose uptake after physical training in young women occurs with and without changes in FFM and body composition. (*J Clin Endocrinol Metab* **85:** 2463–2468, 2000)

AEROBIC EXERCISE training can improve insulin sensitivity (1–4), whereas the role of resistance training to improve the metabolic profile has received less attention. As isometric contractions produce insulin-like effects on glucose uptake in isolated skeletal muscle (5), and skeletal muscle is the primary site of glucose disposal at euglycemia, it is reasonable to hypothesize that increasing skeletal muscle mass may be an effective intervention to improve insulin sensitivity. There is little information on the effects of resistance training on glucose disposal using clamp methodology in a controlled, randomized design. Moreover, investigators have tended to rely on nonrandomized studies and the use of oral glucose tolerance tests to estimate insulin sensitivity (6–9).

To our knowledge, no study has directly compared the effects of endurance *vs.* resistance training on insulin sensitivity using clamp methodology in women. This area of investigation is important because recent data show that despite having a normal body weight, a subset of young women show a cluster of metabolic abnormalities that would predispose them to type 2 diabetes and related comorbidities if left untreated (10). The incidence of obesity and type 2 diabetes is increasing among women (11), which places them at high risk for the development of insulin resistance and associated comorbidities (12, 13). Clearly, preventive public health measures to prevent deterioration of the metabolic profile of younger women are needed before disease processes become established.

To address this topic, we directly compared the effects of resistance training and aerobic training on insulin sensitivity using a controlled randomized trial. Moreover, to examine potential mechanism(s) regulating training effects on insulin sensitivity, we measured changes in body composition, visceral fat, and skeletal muscle density using radiological imaging techniques, as changes in these variables are thought to be related to altered glucose disposal (14–18). We hypothesized that endurance training would increase insulin sensitivity to a greater degree than resistance training in young women, and these changes would be associated with greater reductions in intraabdominal fat and increased skeletal muscle density.

Subjects and Methods

For inclusion in the study, subjects were required to be premenopausal and between 18–35 yr of age with a body mass index less than 26. In addition, subjects had to be weight stable (±2 kg) and to have had no regular participation in exercise for 6 months before the study. Exclusion criteria included a history or evidence on physical examination

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or testing of the following: 1) diabetes, 2) orthopedic limitations or history of pathological fractures, 3) hypertension (>160/90 mm Hg), 4) use of prescription or over the counter medications that could affect glucose metabolism (including insulin and oral hypoglycemic agents), 5) smoking, or 6) alcohol consumption of more than 15 g alcohol/day. An oral glucose tolerance test was performed in all volunteers to determine glucose tolerance according to the criteria of the National Diabetes Group (12) to exclude diabetics. This study was approved by the committee for human research at the University of Vermont, and each participant gave written informed consent before the beginning of the study.

Overview of experimental protocol

Subjects were recruited from local newspaper advertisements in the Burlington, VT, and the University of Vermont community. After determination of eligibility by telephone, volunteers were scheduled for the first screening visit. On the screening visit, an oral glucose tolerance test, medical history, physical examination, maximum oxygen consumption test, and complete blood chemistry and profile were performed. Two weeks later, participants were scheduled for an overnight visit to the General Clinical Research Center at the University of Vermont. For 3 days before the overnight visit, participants were provided with standardized diets prepared by the metabolic kitchen at the General Clinical Research Center containing 55% carbohydrate, 25% fat, and 20% protein. During the afternoon of admission, we conducted body composition and body fat distribution measurements using dual energy x-ray absorptiometry and computed tomography. The following morning, the hyperinsulinemic-euglycemic clamp was performed. After successful completion of this testing sequence, volunteers were randomly assigned to the endurance exercise, resistance exercise, or control group. An identical posttesting sequence was performed, and these tests were performed 4 ± 1 days after the last exercise session.

Recruiting and screening

Based on our advertisements, 321 women were interviewed by telephone. Of these 321 women, 105 women consented to participate in screening procedures. Of these 105 women, 78 were deemed eligible and consented to participate in pretraining testing procedures. Of these 78 women, 74 were Caucasian, 2 were of Asian descent, and 2 were of Hispanic origin. They were randomized to either endurance training, resistance training, or control conditions after completion of physiological testing.

Exercise training programs

All workouts were preceded by a 10-min warm-up, which consisted of stretching of the major muscle groups and slow walking around the track. All women were taught to monitor their heart rates (HR). HRs were verified with a Polar Heart Rate monitor (Polar Electro, Port Washington, NY). The endurance-training program consisted of two parts: 1) weeks 1–16 were an endurance base-training phase; and 2) weeks 17–28 were an interval-recovery phase. Women trained on 3 nonconsecutive days/week for 6 months (28 weeks) under the supervision of a personal trainer.

The endurance base training consisted of four phases. The first phase (first 4 weeks) began with an exercise prescription of 25 min of slow jogging. Thereafter, the aerobic training program of each 4-week phase increased by 5 min. By the fourth phase (*i.e.* 16 weeks), women were jogging for approximately 40 min. Within the phases, the exercise intensity was increased by 5% of maximum HR (HR max) each week, so that by the end of the fourth week of the fourth phase, the training was 40 min at 90% of HR max.

The second part (weeks 16–28) of the endurance training program used interval training sessions. Women followed a detailed program of specific workouts aimed at increasing exercise duration and intensity. The interval sessions consisted of 45 min of 80% HR max training on Monday, four 5-min periods at 95% HR maximum with 3-min rests on Wednesday, and 45 min at 75–80% of HR max on Friday. By the final week of training, women successfully completed 60-min sessions at 85% of HR max.

Women randomized to resistance training exercised on 3 nonconsecutive days during the week (*e.g.* Monday, Wednesday, and Friday) under the supervision of a personal trainer. Because of the need for test specificity, one repetition maximum (1-RM) evaluation of certain exercises used in the training program provided the most direct evaluation of the training gains made over the 6-month period. The 1-RM is defined as the maximum amount of resistance that can be moved through the full range of motion of an exercise for no more than one repetition. To determine the 1-RM, each subject initially performed three to five repetitions with the lightest weight possible to assure that proper technique was used. The trainer then selected a weight and asked the subject to perform the lift. After 3–4 min of rest, the next heaviest weight was selected, and the attempt was repeated until the subject could not complete the full lift. The same number of trials, time between trials, and order of exercises were used before and after training for the 1-RM test. Tests were administered before the start of the training program, midway through the program, and after the exercise program. The following exercises were evaluated for 1-RMs: leg press, bench press, military press, and seated rows.

Training was approximately 80% of 1-RM. Each training session included a warm-up of low intensity cycling for 5 min, followed by 10 min of static stretching of all of the major muscle groups used in training. Each exercise session was individually monitored for optimal progression by two trainers. The resistance program consisted of the following exercises: 1) leg press, 2) bench press, 3) leg extensions, 4) shoulder press, 5) sit-ups, 6) seated rows, 7) tricep extensions, 8) arm curls, and 9) leg curls. The exercises provided a total body resistance training program for all of the major muscle groups of the body. The volunteer was given a target load range and attempted to keep each set ($n = 3$) within the target range by adjusting the load to allow the prescribed number ($n = 10$) of repetitions. Resting periods were 1–1.5 min between sets.

During the conduct of the training programs, 28 women dropped out of the study, yielding a dropout rate of 36%. The reasons for dropouts included 1) noncompliance with training ($n = 18$), 2) relocation ($n = 3$), 3) injury related to endurance training ($n = 3$), 4) refused posttesting ($n = 2$), 5) health problems not related to training ($n = 1$), and 6) pregnancy ($n = 1$). Thus, 51 women (17 resistance, 14 endurance, and 20 control) satisfactorily completed all pre- and posttesting procedures and the 6-month training program. The exercising women successfully completed 90% of all exercise-training sessions. Oral contraceptive use was 47% in resistance-trained women (8 of 17), 50% in endurance-trained women (7 of 14), and 50% in controls (10 of 20).

Body composition and adipose tissue distribution

Fat mass and fat-free mass (FFM) were measured by dual energy x-ray absorptiometry using a DPX-L densitometer (Lunar Corp., Madison, WI) as previously described (19). All scans were analyzed using the Lunar Corp. version 1.3 DPX-L extended analysis program for body composition. The test-retest coefficient of variation for this measurement was 1.2% for fat mass and 2% for FFM, respectively.

Visceral and sc adipose tissue areas were measured by computed tomography with a GE High Speed Advantage CT scanner (General Electric Medical Systems, Milwaukee, WI) as previously described (19). Subjects were examined in the supine position with both arms stretched above the head. The scan was performed at the L4–L5 vertebrae level using a scout image of the body to establish the precise scanning position. Visceral adipose tissue area was quantified by delineating the intraabdominal cavity at the internal most aspect of the abdominal and oblique muscle walls surrounding the cavity and the posterior aspect of the vertebral body with the computer interface of the scanner. Adipose tissue was highlighted and computed using an attenuation range from −190 to −30 Hounsfield units (HU) (20). The sc adipose tissue area was quantified by highlighting adipose tissue located between the skin and the external-most aspect of the abdominal muscle wall. The same individual analyzed all scans, and the intraclass correlation for repeated analysis of 10 scans was 0.99 in 10 women. Computed tomography was also used to measure cross-sectional areas of midthigh muscle and adipose tissue and to characterize muscle attenuation. With the subject supine, a 5-mm cross-sectional scan of both legs was obtained, located at the midpoint between the anterior iliac crest and the top of the patella. In image analysis, areas of adipose tissue and skeletal muscle were measured by selecting the following region of interest defined by attenuation values: −190 to −30 HU for adipose tissue and 0–100 HU for muscle.

Cardiorespiratory fitness

Maximum aerobic capacity ($VO_{2\ max}$) was determined from an incremental exercise test on a treadmill to volitional exhaustion, as previously described (21, 22). After an initial 3-min warm-up, the speed was held constant, and the grade was increased by 2.5% every 2 min. The criteria for achieving a $VO_{2\ max}$ were 1) a respiratory exchange ratio greater than 1.0, 2) a HR at or above the age-predicted maximum, and 3) no further increase in oxygen consumption with an increasing workload. At least two of these criteria were met by all volunteers. Test-retest conditions for nine individuals (on two occasions, tested 1 week apart) yielded an intraclass correlation of 0.94 and a coefficient of variation of 3.8% in our laboratory.

Insulin sensitivity

We measured insulin sensitivity by the hyperinsulinemic-euglycemic clamp technique as described by DeFronzo *et al.* (23) and as previously reported in our laboratory (10, 24). Briefly, a Teflon catheter was inserted into the antecubital vein for the infusions of insulin and dextrose. Another Teflon catheter was retrogradely placed into the dorsal vein of the contralateral hand and used for the blood draws during the clamp procedure. This hand was placed in a hot box and warmed to 50 C for arterialization of blood. At 0 min, a continuous infusion of insulin was started at a constant rate of 40 mU/m^2 body surface area·min. At the same time, a variable infusion of 20% dextrose was started to maintain fasting glycemia at ±5% (80 ± 4.4 mg/dL in endurance-trained women, 80 ± 6.4 mg/dL in resistance-trained women, and 81 ± 6.2 mg/dL in controls). Blood samples for glucose measurement were taken every 5 min for insulin measurement at −30, −10, 0, 30, 60, 70, 90, 105, and 120 min of the clamp. The insulin levels attained during the last 30 min of the clamp (90–120 min) before training were 75 ± 23 μU/mL in endurance-trained women 74 ± 21 μU/mL in resistance-trained women, and 76 ± 20 μU/mL in controls (P = NS). After training, insulin levels were 76 ± 28 μU/mL in endurance-trained women, 72 ± 22 μU/mL in resistance-trained women, and 75 ± 23 μU/mL in controls (mean ± SD). The insulin-stimulated glucose disposal rate (M-value) was calculated as the average glucose infusion rate (milligrams per min) during the last 30 min of the 120-min clamp. Hepatic glucose production has previously been shown to be fully suppressed with the insulin dose used in our study to induce hyperinsulinemia (25).

Biochemical analyses

Plasma glucose concentrations were measured using the glucose oxidase method with an automated glucose analyzer (YSI, Inc., Yellow Springs, OH). Serum insulin was measured by a double antibody RIA (Diagnostics Products, Los Angeles, CA). The coefficient of variation for glucose measurement using the glucose oxidase method is less than 1.9%. The coefficient of variation for serum insulin measurement by the doubly antibody RIA method is less than 5%.

Statistical analysis

Differences in physical characteristics among groups at baseline were examined using a one-way ANOVA. A 2 × 3 repeated measures ANOVA was used to detect changes with time within the treatment condition (pre/post) and among groups (endurance *vs.* resistance *vs.* control). The repeated measures factor was the repeated tests during the exercise programs. Pearson product-moment correlation coefficients were used to examine the association between variables. Significance was accepted at $P < 0.05$.

Results

Table 1 shows physical characteristics for endurance-training, resistance-training, and control subjects before and after training. There were no differences among the three groups in baseline physical characteristics, suggesting a successful randomization. As expected, endurance-trained individuals increased their absolute VO_2max by 29% ($P < 0.01$), whereas no changes were noted in resistance-trained and control subjects. Similar results were obtained when VO_2max data were expressed per kg BW. Body weight and body mass index increased in resistance-trained individuals (both $P < 0.05$) relative to those in the other two groups. Fat mass, as measured by dual energy x-ray absorptiometry, showed no change in endurance-trained, resistance-trained, or control women. FFM showed no change in endurance-trained women or controls, but increased in resistance-trained women (2 kg; $P < 0.001$). As expected, resistance-trained individuals increased their 1-RM for leg press (29%), bench press (39%), military press (29%), and seated rows (27%; data not shown in table form). There was no increase in VO_2 max in the resistance-trained group, and there was no change in strength in the endurance-trained group.

Figure 1 shows pre- and posttraining values for absolute values of insulin sensitivity and indexed per kg FFM. Insulin sensitivity increased in both endurance-trained (pre, 421 ± 107; post, 490 ± 133 mg/min; $P < 0.05$) and resistance-trained (pre, 382 ± 87; post, 417 ± 89 mg/min; $P = 0.06$) women, with no change in controls (pre, 470 ± 139; post, 480 ± 168 mg/min). When data were expressed per kg FFM, the improvement in glucose disposal persisted in endurance-trained women (pre, 10.5 ± 2.7; post, 12.1 ± 3.3 mg/kg FFM·min; $P < 0.05$), whereas no significant change was noted in resistance-trained (pre, 9.7 ± 1.9; 10.2 ± 1.8 mg/kg FFM·min) and controls (pre, 11.4 ± 2.8; post, 11.8 ± 3.5 mg/kg FFM·min). The improvement in VO_2 max was not related (r = 0.02; P =

TABLE 1. Changes in characteristics of younger women before and after training

Physical characteristic	Endurance training (n = 14)		Resistance training (n = 17)		Control (n = 20)	
	Pre	Post	Pre	Post	Pre	Post
Age (yr)	29 ± 5		28 ± 3		28 ± 4	
VO_{2max} (L/min)	2.1 ± 0.5	2.7 ± 0.5[a]	2.1 ± 0.4	2.2 ± 0.3	2.2 ± 0.5	2.3 ± 0.4
Ht (cm)	163 ± 5		164 ± 7		165 ± 7	
BW (kg)	59 ± 5	59 ± 5	58 ± 6	60 ± 6[b]	60 ± 7	61 ± 8
BMI (kg/m^2	22 ± 2	22 ± 2	22 ± 2	23 ± 2[b]	22 ± 2	22 ± 2
DEXA measures						
Fat mass (kg)	16 ± 5	15 ± 4	16 ± 4	17 ± 4	17 ± 6	17 ± 6
Fat-Free mass (kg)	40 ± 4	40 ± 4	39 ± 4	41 ± 3[a]	39 ± 4	40 ± 3

Values are the means ± SD. BMI, Body mass index; Pre/Post, 6 months of endurance or resistance training.
[a] P < 0.001.
[b] P < 0.05.

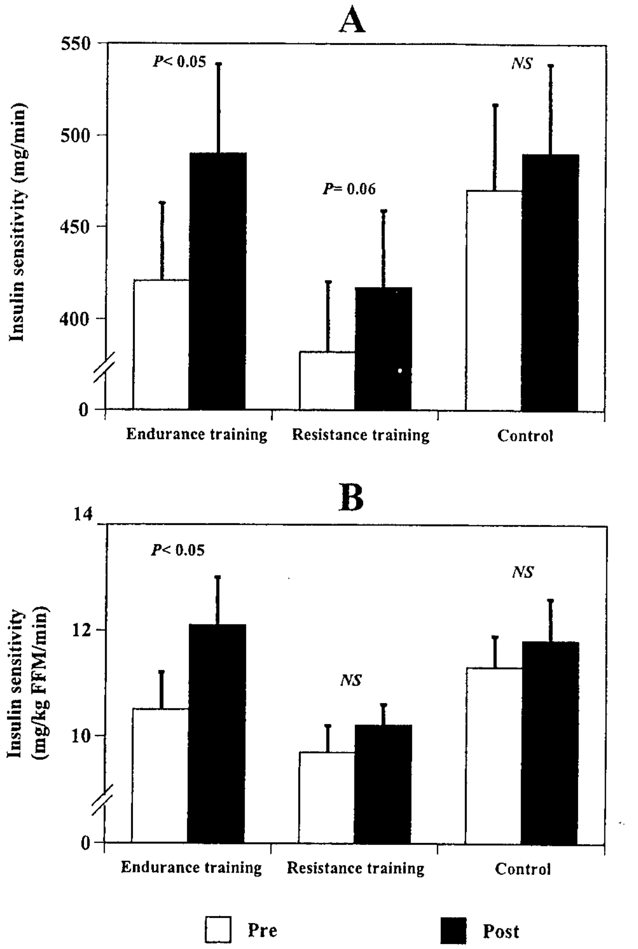

FIG. 1. Changes in insulin sensitivity before and after endurance training and resistance training and in control conditions. A, Values expressed on an absolute basis; B, values indexed per kg FFM. Values are the mean ± SE. *, $P < 0.05$.

NS) to increased insulin sensitivity in the endurance-trained group.

Table 2 shows changes in abdominal adiposity, thigh adipose content, and lean tissue content before and after training. As expected for nonobese young women, baseline areas of sc adipose tissue and visceral adipose tissue were low. No significant changes were noted in sc or visceral adipose tissue in any group, as measured by computed tomography. Skeletal muscle characteristics, as estimated from computed tomography, are also shown in Table 2. We estimated quantities of midthigh fat area, thigh muscle area, and muscle attenuation values because of their reported relationship to insulin sensitivity (14, 15). Midthigh fat and muscle areas did not change in response to endurance or resistance training. On the other hand, we noted an altered composition in computed tomographic imaging in terms of higher mean attenuation values (HU) for both endurance-trained ($P < 0.05$) and resistance-trained ($P < 0.001$) individuals, suggesting a reduction in skeletal muscle lipid content. Changes in muscle attenuation in endurance-trained and resistance-trained individuals, however, were not related ($r = 0.24$; P = NS) to improved insulin sensitivity.

Discussion

Insulin resistance is linked with physical inactivity, increased visceral fat, and alterations in skeletal muscle characteristics. Moreover, we have shown the presence of these obesity-related phenotypes even in normal weight, apparently healthy, young women (10). Thus, interventions to improve or prevent the deterioration of the metabolic profile in this population have significant public health interest. The major findings are that both endurance and resistance training improve glucose disposal in young women, although by different mechanisms. An increase in the quantity of FFM from resistance training contributes to increased glucose disposal, probably from a mass effect, without altering the intrinsic capacity of the muscle to respond to insulin. On the other hand, endurance training enhances glucose disposal independent of changes in FFM, fat mass, or VO_2max, suggestive of an intrinsic change in the ability of the muscle to metabolize glucose.

Our experimental and methodological approaches lend credibility to our findings. Volunteers were randomly assigned to treatment conditions to control for known and unknown sources of experimental bias and subject self-selection. Moreover, the use of a control group decreases the influence of a placebo effect, and the application of euglycemic/hyperinsulinemic clamps and radiological imaging techniques provide direct measures of insulin sensitivity, body composition, and regional fat.

We originally hypothesized that endurance training would improve insulin sensitivity to a greater degree than resistance training due to a greater reduction in total fat and visceral fat. The physiological basis underlying our hypothesis is derived from several lines of evidence. First, endurance training may preferentially reduce visceral fat (26). Second, lower levels of visceral fat are associated with higher levels of insulin sensitivity and an improved metabolic profile (14–17, 27, 28). This hypothesis, however, was only partially supported by our findings in the present investigation. That is, endurance training improved insulin sensitivity to a greater degree than resistance training when expressed on an absolute basis or indexed per kg FFM. However, no change in total body fat, intraabdominal fat, or sc abdominal fat was found in endurance-trained women. Although it has been suggested that exercise training leading to a reduction in body fat is a prerequisite to improve glucose disposal (29), our findings as well as others (30) refute this assertion. Our results suggest that a vigorous program of endurance training improves glucose disposal independent of a reduction in total and regional body fat in nonobese young women.

It is possible that the volume of endurance exercise used in this study was inadequate to significantly modify total or regional body fat in young women who are not restricting energy intake. Indeed, it is possible that increased energy expenditure is compensated for by a greater energy intake, thus blunting any detectable change in total or regional body fatness (31, 32). Another potential reason underlying the absence of changes in body fatness is the potential of a ceiling effect. That is, it is difficult to reduce total or visceral fat in young women whose baseline levels are already low. This concept is supported by the findings of Wilmore and colleagues (33). They found only a small

TABLE 2. Changes in abdominal adiposity, thigh adipose, and lean tissue content in younger women before and after training

Physical characteristic	Endurance training (n = 14)		Resistance training (n = 17)		Control (n = 20)	
	Pre	Post	Pre	Post	Pre	Post
CT scan measures						
SAT area (L4-L5, cm^2)	194 ± 86	193 ± 80	186 ± 74	186 ± 85	147 ± 66	210 ± 95
VAT area (L4-L5, cm^2)	40 ± 11	41 ± 13	36 ± 17	36 ± 13	36 ± 13	41 ± 15
Thigh fat area (cm^2)	98 ± 34	90 ± 24	108 ± 32	102 ± 38	98 ± 29	101 ± 31
Thigh muscle area (cm^2)	108 ± 11	114 ± 14	109 ± 19	115 ± 16	119 ± 16	113 ± 17
Muscle attenuation (HU)	49 ± 3	51 ± 1[a]	50 ± 2	52 ± 1[a]	48 ± 2	48 ± 2

Values are the means ± SD.
[a] $P < 0.05$.

reduction in intraabdominal fat (-3.1 ± 0.7 cm^2; mean ± SE) in 299 overweight young women after an endurance training program similar to the one conducted in this investigation. This small decrement in intraabdominal fat, compared to the absence of changes in our study, probably reflects their greater baseline intraabdominal values in their overweight cohort (67 ± 45 cm^2) compared to our nonobese women (40 ± 11 cm^2). Unfortunately, no measure of insulin sensitivity was reported in their investigation, thus rendering the effects of a reduction in intraabdominal fat on insulin sensitivity unknown. It is likely that the volume of physical activity performed in the present study may be more beneficial in preventing increases in total and regional fat with advancing age rather than in promoting fat loss (34, 35).

As insulin-mediated glucose disposal occurs mainly in muscle, one would hypothesize that an increase in the skeletal muscle mass component of FFM would augment glucose disposal. Our data support this suggestion, as the absolute change in glucose disposal (milligrams per min) was related to the increase in FFM ($r = 0.48$; $P < 0.05$) after resistance training. There was no change, however, in glucose disposal when indexed per kg FFM. We interpret this finding to suggest that improved insulin sensitivity probably reflects a mass effect without altering the intrinsic capacity of the muscle to respond to insulin. The failure of resistance training to enhance insulin sensitivity per kg FFM could be due to the inability of resistance exercise to increase muscle capillary density (36) or to change muscle fiber types in an insulin-sensitive direction (37).

It is likely that the timing of our insulin sensitivity values measured relative to the last bout of exercise (4 ± 1 days) may partially reflect a detraining response on insulin sensitivity. That is, insulin sensitivity decreases as a function of time once the individual stops endurance training. We would suggest, however, that our selection of the time period to measure insulin sensitivity was reasonable, given that previous studies (30, 38, 39) showed a sustained effect of exercise training on insulin sensitivity measured 4–7 days after the last exercise bout. The magnitude of increase in resistance-trained (9%) and endurance-trained (16%) individuals was comparable to the 11% and 13% increases reported by Hughes and colleagues (30) and Tonino (38), respectively. These increases in glucose disposal, however, are less than those reported by other investigators (24–28%) (40, 41) who measured insulin sensitivity 48 h after the last exercise bout, when the residual effects of exercise are still intact. Volunteers in these studies, however, were not randomly assigned to treatment conditions, nor did these investigators consider the effects of resistance training on insulin sensitivity.

We also considered the hypothesis that changes in lipid content within the skeletal muscle may predict changes in insulin sensitivity in women undergoing exercise training. This hypothesis is based on recent data showing that fat deposition within muscle may be an important aspect of body composition that is linked to insulin resistance (14, 15, 18). We used computed tomographic imaging to examine skeletal muscle at the level of the midthigh. We noted an increase in the attenuation values in endurance- and resistance-trained women, which most likely reflects a decrease in skeletal muscle fat content. However, we noted no relation between the improved glucose disposal and increased muscle attenuation values in endurance-trained or resistance-trained women ($r = 0.24$; $P =$ NS). Thus, it is likely that other mechanisms are operative. For example, several investigators have suggested that the long-term regulation of the number and function of glucose transporters (42, 43), capillary proliferation (44), and the number of IIa (red glycolytic) fibers that have a higher GLUT-4 content and are more insulin responsive (45) are implicated in the improved insulin sensitivity in response to chronic exercise.

We identified only three reports in the literature (6, 46, 47) that examined the effects of both endurance and resistance training on proxy measures of insulin sensitivity. These studies, however, are not directly comparable to the present investigation because of differences in age, sex, initial metabolic characteristics of the volunteers, and experimental design differences. Two of these studies (6, 46) were performed in older men with untreated abnormal glucose regulation. Moreover, volunteers self-selected their mode of exercise, which raises questions regarding the biases introduced with subject self-selection. Both of these studies used an oral glucose tolerance test and found that endurance and resistance training reduced plasma glucose and insulin responses to an equivalent oral glucose load, suggestive of improved glucose tolerance and insulin sensitivity. On the other hand, Eriksson and colleagues (47) examined older men and women in a 6-month nonrandomized endurance-training study and found no discernible effect on insulin sensitivity, as measured by an iv glucose tolerance test. In the same study they used a 10-week circuit training program and found improved insulin sensitivity (23%) in eight males, as assessed with a euglycemic/hyperinsulinemic clamp technique. We suggest that additional randomized studies, such as our own, using similar methodologies and in different populations, are needed to confirm our findings.

In summary, enhanced glucose uptake after physical training in young women occurs with and without changes in FFM and body composition. Two different mechanisms appear to be operative. Improved insulin sensitivity in resistance-trained women is probably due to a mass effect (*i.e.* increased FFM), whereas endurance training enhances glucose disposal independent of changes in FFM or VO_2max, suggestive of an intrinsic change in the muscle to metabolize glucose. We conclude that both endurance and resistance training programs are effective interventions to enhance glucose disposal in young, nonobese women.

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APPENDIX III

EFFECTS OF ENDURANCE AND RESISTANCE TRAINING ON TOTAL DAILY ENERGY EXPENDITURE IN YOUNG WOMEN: A CONTROLLED RANDOMIZED TRIAL

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ABSTRACT

There exists considerable controversy regarding the impact of different modes of exercise training on total daily energy expenditure. To examine this question, young, non-obese women, were randomly assigned to a supervised six-month program of endurance training resistance training or control condition. Total daily energy expenditure was measured before and 10 days after a six month exercise program was completed with doubly labeled water. Body composition was determined from dual energy x-ray absorptiometry, VO_2 max from a treadmill test to exhaustion and muscular strength from 1-repetition maximum tests. Results showed that body composition did not change in endurance trained women, but VO_2 max increased by 18%. Resistance trained women increased muscular strength and fat-free mass (1.3 kg). Total daily energy expenditure did not significantly change when measured subsequent to the endurance or resistance training programs. Absolute resting metabolic rate increased in resistance trained women, but not when adjusted for fat-free mass. No change in physical activity energy expenditure was found in any of the groups. These results suggest that endurance and resistance training does not chronically alter total daily energy expenditure in free-living young women. Thus, the energy enhancing benefits of exercise training are primarily derived from the direct energy cost of exercise and not from a chronic elevation in daily energy expenditure in young, non-obese, women.

Key Words: Energy Expenditure, Exercise, Endurance Training, Resistance Exercise

INTRODUCTION

Regular physical activity is viewed as an adjunct to body weight control by facilitating the matching between daily energy expenditure and daily energy intake which favors a state of energy balance (1,2). It is clear that energy expenditure is transiently increased due to the direct and short-term carry-over effects of physical exercise (3). A body of literature, however, has accumulated that suggests that exercise training (endurance and/or resistance training) may chronically increase energy expenditure independent of the direct energy cost of the training program (4,5). The additional increase in energy expenditure may be mediated by several mechanisms including: an increase in resting metabolic rate (6-24); an increase in physical activity energy expenditure (24-26) and/or an increase in sympathetic nervous system activity (10, 11). This notion remains controversial, however, as other investigators have found no effect of endurance or resistance training on resting and/or physical activity energy expenditure after exercise training (27-36). Some investigators have even suggested that regular exercise training may decrease physical activity energy expenditure (37, 38).

Discrepant results among investigators regarding the effects of exercise training on daily energy expenditure may be partially due to differences in methodological and experimental design factors. First, physical exercise has been traditionally studied in isolation, without regard to its potential influence on total daily energy expenditure. This methodological limitation has recently been overcome with the application of doubly labeled water, which quantifies total daily energy expenditure in free-living individuals. Second, investigators have tended to rely on cross-sectional designs (ie, trained *vs* untrained individuals) to examine the impact of exercise training on daily energy expenditure. Cross-sectional experimental approaches, although experimentally convenient, are fraught with potential confounders, such as subject self-selection and genetic biases. Third, the methodological assessment of daily energy expenditure has been problematic in free-living individuals. Investigators have tended to rely on physical activity questionnaires, accelerometers, pedometers, etc, which provide questionable estimates of daily energy expenditure (39). Fourth, there has been some confusion between the "chronic" and "acute" effects of exercise on energy metabolism. That is, most studies have examined energy expenditure during or immediately after the end of the exercise program (within 24 hours), thereby obscuring the potential chronic effect of exercise on energy metabolism. Relative to this point, it is important to consider that suspension of exercise training for 72 hours is associated with a decrease in resting energy expenditure (40).

Thus, in an attempt to partially resolve some of these controversies in the literature, we examined the effects of both endurance and resistance training on total daily energy expenditure and its components in young, non-obese sedentary women. We performed our measures of daily energy expenditure before and 10 days after the exercise programs were completed. Furthermore, we used a randomized controlled clinical trial to help control for known and unknown sources of experimental bias.

METHODS

Subjects. Criteria for subject inclusion was: premenopausal and age between 18 to 35 years; a body mass index less than 26. In addition, subjects had to be weight stable (± 2kg) and not participating in a regular exercise program for six months prior to the study. Exclusion criteria included a history or evidence on physical examination or testing of the following: 1) diabetes (41); 2) orthopedic limitations or history of pathologic fractures, 3) hypertension (>160/90 mmHg; 4) use of prescription or over the counter medications which could affect energy expenditure; 5) smoking; and 6) alcohol consumption greater than 15g of alcohol/day (1 alcoholic beverage). An oral glucose tolerance test (OGTT) was performed in all volunteers to determine glucose tolerance according to the criteria of the National Diabetes Group (41) to exclude diabetics. This study was approved by the Committee for Human Research at the University of Vermont and each participant gave their written, informed consent prior to the beginning of the study.

Overview of Experimental Protocol: Subjects were recruited from local newspaper advertisements in the Burlington, Vermont and the University of Vermont community. After determination of eligibility by telephone, volunteers were scheduled for the first screening visit. On the screening visit, an oral glucose tolerance test, medical history, physical examination, maximum oxygen consumption test and complete blood chemistry and profile were performed. Two weeks later, participants were scheduled for an overnight visit to the General Clinical Research Center (GCRC) at the University of Vermont. For three days prior to the overnight visit, participants were provided with standardized diets prepared by the metabolic kitchen at the GCRC containing 55% carbohydrate, 25% fat and 20% protein. During the afternoon of admission, we conducted body composition measurements using dual energy x-ray absorptiometry. As well, participants were administered the dose of doubly labeled water as described below and baseline urine was collected for analysis. The next morning, we measured resting metabolic rate using indirect calorimetry and subjects were submitted to the treadmill stress test. Following 10 days of normal daily activity, participants returned to the GCRC for post-urine collection. Upon successful completion of this testing sequence, volunteers were randomly assigned to endurance exercise, resistance exercise or control conditions. An identical sequence of post-testing measures were performed following the six month intervention period. Because the goal of the study was to examine the effects of endurance and resistance training after the programs were completed, post-training measures were conducted approximately 72 hours after the last exercise bout. TEE was then measured over the following ten days. We have previously reported changes in insulin sensitivity from this group (42).

Recruiting and Screening: Based on our advertisements, 321 women were interviewed by telephone. Of these 321 women, 105 women consented to participate in screening procedures. Of these 105 women, 89 were deemed eligible and consented to participate in pre-training testing procedures. Of these 89 women, 85 were Caucasian, 2 of Asian descent and 2 of Hispanic origin. They were randomized to either aerobic training, resistance training or control condition. A total of 31 women dropped out of the study for various reasons (detailed in the *Exercise training programs section*) and 10 women were not dosed with doubly label water because of a worldwide shortage. Thus, the final number of women who completed the study was as following: aerobic training n = 13, resistance training n = 16 and control condition n = 19.

Exercise Training Programs. All endurance exercise sessions were preceded by a 10 min warm-up which consisted of stretching of the major muscle groups and slow walking around the track. All women were taught to monitor their heart rates (HR). HRs were verified with a Polar Heart Rate monitor (Polar Electro, Port Washington, NY).

The endurance-training program consisted of two parts: 1) weeks 1 to 16 were an endurance base-training phase; and 2) weeks 17 to 24 were an interval-training phase (both described below). Women trained on 3 non-consecutive days/week for 6 months (24 weeks) under the supervision of a personal trainer.

Endurance base-training phase (weeks 1-16). The first four weeks consisted of an exercise prescription of 25 min of slow jogging and/or brisk walking at 60% of heart rate. Thereafter, every 4-week period would be performed as follows: at the beginning of the 4-week period, time would increase by 5 minutes and intensity would increase by approximately 10% of heart rate every week (from 60% at week 1 to 90% of heart rate at week 4). At the beginning of the next 4-week period, time would increase by another 5 minutes and intensity would be scaled back to 60% of heart rate. On week 16, women were walking or jogging for 40 min at 90% of maximal heart rate.

Interval training (weeks 17-24). Women followed a detailed program of specific workouts aimed at increasing exercise duration and intensity. The interval sessions consisted of 45 min of 80-90% HR max training on Monday, four 5 min periods at 95% HR maximum with 3-min rests on Wednesday, and 45 min at 80-90% of HR max on Friday.

Women randomized to resistance training exercised on 3 non-consecutive days during the week (eg, Monday, Wednesday, and Friday) under the supervision of a personal trainer. Because of the need for test specificity, 1 repetition maximum (RM) evaluations of certain exercises used in the training program provided the most direct evaluation of the training gains made over the 6-month period. The 1-RM is defined as the maximum amount of resistance that can be moved through the full range of motion of an exercise for no more than one repetition. To determine the 1 RM, each subject initially performed 3 to 5 repetitions with the lightest weight possible to be sure proper technique is used. The trainer then selected a weight and asked the subject to perform the lift. Following 3-4 minutes of rest, the next heaviest weight was selected and the attempt was repeated until the subject could not complete the full lift. The same number of trials, time between trials and order of exercises were used before and after training for the 1-RM test. Tests were administered prior to the start of the training program, midway through the program and after the exercise program. The following exercises were evaluated for 1 RM's: leg press, bench press, shoulder press and seated rows. Training was approximately 60-80% of 1 RM at the beginning with the goal of having all subjects train at 80% 1RM by the second week of the program. Each training session included a warm-up of low intensity cycling for 5 min, followed by a 10 min of static stretching of all the major muscle groups used in training. The resistance program consisted of the following exercises: 1) leg press, 2) bench press; 3) leg extensions; 4) shoulder press; 5) sit-ups; 7) seated rows; 8) tricep extensions; 9) arm curls; and 10) leg curls. The exercises provided a total body resistance training program for all of the major muscle groups of the body. The volunteer was given a target load range and attempted to keep each set within the target range by adjusting the load to allow the prescribed number (n=10) of repetitions. Rest periods were 1-1.5 minutes between sets.

During the conduct of the training programs, 31 women dropped out of the study, yielding a dropout rate of 32%. The reasons for dropouts included: 1) non-compliance with training (n=16); 2) relocation (n=3); 3) injury related to endurance training (n=5); 4) refused post-testing (n=2;) 5) health problems not related to training (n=3) and 6) pregnancy (n=2). Thus, 58 women (20 resistance, 20 endurance, and 18 control) satisfactorily completed all pre-and post-testing procedures and the six-month training program. Because of a shortage of doubly labeled water, we were able to dose 48 subjects. Herein, we report the results of 48 subjects who completed all tests. The exercising women successfully completed 90% of all exercise training sessions. Oral contraceptive use was 70% in resistance-trained women (14 of 20), 35% in endurance-trained women (7 of 20), and 50% in controls (9 of 18) (chi-square p=0.09).

Measures of Energy Expenditure:

Total daily energy expenditure (TEE): TEE was determined from doubly labeled water over a 10-day period before and after the training programs. After the exercise program was completed, total daily energy expenditure was measured during a 10 day-period, starting 72 hours after the last exercise session, during which subjects were asked to abstain from any structured exercise program. During that period, subjects were asked to maintain their normal daily physical activity routines. Specific details about the doubly labeled water technique the analyses have previously been described (43,44).

Resting metabolic rate (RMR): RMR was measured for 60 min by indirect calorimetry using the ventilated hood technique (9,10), following an overnight, 12-hour fast in the General Clinical Research Center. RMR was specifically measured on the first day of urine collections for the doubly labeled water. Respiratory gas analysis was performed using a Deltatrac metabolic cart

(Sensormedics, Yorba Linda, CA). RMR (kcal d^{-1}) was calculated from the equation of Weir (45). The test-retest correlation coefficient within one week has been shown to be 0.90 for RMR in our laboratory. The respiratory quotient (RQ) was calculated from indirect calorimetry. Test-retest correlation coefficients for respiratory quotient are 0.91 in our laboratory.

Physical activity energy expenditure (PAEE): Doubly labeled water in conjunction with indirect calorimetry was used to measure PAEE. PAEE was calculated using the following equation: PAEE = TEE - (RMR + TEM), as previously reported from our laboratory (26,37). TEM was estimated as 10% of total daily energy expenditure (23).

Body composition. Fat mass and fat-free mass were measured by dual energy x-ray absorptiometry (DEXA) using a Lunar DPX-L densitometer (Lunar Co, Madison, WI) as previously described (37,42). All scans were analyzed using the Lunar Version 1.3 DPX-L extended-analysis program for body composition. Test-retest coefficient of variation for this measurement was 1.2% for fat mass and 2% for fat-free mass, respectively.

Cardiorespiratory fitness. Maximum aerobic capacity (VO_2 max) was determined from an incremental exercise test on a treadmill to volitional exhaustion, as previously described (42). After an initial 3-minute warm-up, the speed was held constant and the grade was increased by 2.5% every 2 minutes. The criteria for achieving a VO_2 max were: a respiratory exchange ratio greater than 1.1; 2) a heart rate at or above the age-predicted maximum; and 3) no further increase in oxygen consumption with an increasing workload. At least two of these criteria were met by all volunteers.

Test-retest conditions for 9 individuals (on two occasions tested one week apart) yielded an intra-class correlation of 0.94 and a CV of 3.8% in our laboratory.

Statistical Analysis: Differences in physical characteristics among groups at baseline were examined using a one-way analysis of variance. A 2 x 3 repeated measures analysis of variance was used to detect changes with time within the treatment condition (pre/post) and among groups (endurance vs resistance vs control). The repeated measures factor was the repeated tests during the exercise programs. Significance was accepted at $P<0.05$.

RESULTS

Table 1 shows physical characteristics for endurance-trained, resistance-trained and control subjects before and after training. There were no differences among the three groups in baseline physical characteristics, suggesting a successful randomization. Body weight and body mass index did not change in endurance-trained, resistance-trained, or control groups. Fat mass showed no change in endurance-trained, resistance-trained, or control women. Fat-free mass showed no change in endurance-trained or control women, but increased in resistance-trained women ($P<0.05$) compared to controls. Endurance-trained individuals increased their VO_2 max by 18%, whereas no changes were noted in resistance-trained or control subjects for this variable. Resistance-trained women increased their 1-RM for leg press (29%), bench press (39%), shoulder press (29%), and seated rows (27%, data not shown).

Table 2 shows data for total daily energy expenditure and its components (RMR and physical activity energy expenditure) in endurance-trained, resistance-trained, and control subjects before and after training. There were no differences at baseline among groups in any component of daily energy expenditure. Following the training intervention, there were no significant or chronic changes in any group in total daily energy expenditure. Absolute resting metabolic rate (RMR) increased in resistance-trained women ($P < 0.05$) but did not significantly change when adjusted for fat-free mass. There was no change in absolute or relative RMR in either the endurance-trained or control group. Physical activity energy expenditure, as measured by doubly labeled water, showed no changes in any group following the training period. Similarly, fasting respiratory quotient was not different among groups at baseline and showed no changes in response to endurance or resistance training.

DISCUSSION

We examined the effects of both endurance and resistance training on total daily energy expenditure and its components in young, non-obese sedentary women, using a randomized clinical trial. We found that despite significant increases in VO_2 max and muscular strength in endurance and resistance trained groups, respectively, total daily energy expenditure was unchanged. These findings argue against a chronic enhancing effect of endurance or resistance exercise on total daily energy expenditure in free-living young women.

Our experimental design and methods lend credibility to our findings. First, the use of a randomized, controlled, clinical trial helps control for experimental sources of known and unknown biases, including subject self-selection, seasonality, etc. To our knowledge, no previous study has used this experimental approach and the majority of exercise studies lack a control group. Second, most studies have focused on the exclusive measurement of resting metabolic rate (6,7,9-12,14-23,27,32,33,35), whereas total daily energy expenditure is of greater clinical relevance with respect to body weight regulation. Some studies have measured daily energy expenditure *during* the exercise training program (13,24,25,36-38). This approach provides useful information on the acute energetic adaptations to exercise training, but not on chronic adaptations. Lastly, several investigators have determined the effects of chronic training on daily energy expenditure in a room calorimeter, which unfortunately underestimates physical activity energy expenditure (8,29,34). This study extends these previous studies by examining total daily energy expenditure in endurance and resistance trained young women.

The effects of endurance training on total daily energy expenditure are controversial (1-5). Although it is intuitively appealing from a public health perspective to hypothesize that endurance training may chronically increase energy expenditure beyond the energy cost of the training program itself (4,5), these assumptions remain unsubstantiated. This is partially due to the timing of the metabolic measurements relative to the exercise program. Several studies have measured daily energy expenditure during exercise training. For example, we (37) and others (38) reported no change in daily energy expenditure in response to endurance training in older men and women. This was due, partially, to a compensatory decline in non-exercising physical activity which offset the direct energetic cost of the endurance exercise program. Still other investigators have reported an increase in daily energy expenditure with endurance training (25,35,46), but this was due to the *direct* energetic cost of the endurance exercise and not to a change in resting metabolic rate or physical activity energy expenditure during non-exercising time. It has even been suggested that energetic adaptations to exercise training are gender-specific, in which exercise may stimulate habitual physical activity in males, but less so in females (25). Despite significant increases in VO_2 max in the present study, total daily energy expenditure after training was similar to pre-training values in young women. Thus, we interpret these findings to suggest that there is no chronic or "carry-over" effect of endurance training on daily energy expenditure subsequent to the exercise programs. Had we encouraged participants to be more physically active, they may have been more capable of doing so in their trained state; however, an increase in physical activity did not occur spontaneously.

Our results illustrate the differences that may be obtained from cross-sectional vs longitudinal investigations. That is, previous cross-sectional studies have suggested that a higher VO_2 max is associated with higher resting metabolic rate per kilogram of fat-free weight and physical activity energy expenditure (6,9-12 16-21,26,46), although these results are discrepant (32-34). Given the present findings, we would suggest that cross-sectional physiological relationships do not always reflect physiological changes observed in exercise intervention studies. Our study, however, cannot address the question of whether years of participation in endurance exercise training influences daily energy expenditure in young women.

The effect of resistance training on daily energy expenditure, using doubly labeled water, has been studied less extensively than endurance training. We are aware of only two studies that examined the effects of resistance training on total daily energy expenditure (24,36). Van Etten and colleagues (36) measured daily energy expenditure in young men with doubly labeled water before and *during* an 18-week resistance training program. They found a mean increase in daily energy expenditure 18 weeks into a resistance training program that approached 260 kcal/day, of which the majority was due to the direct caloric cost of the resistance training program (47). These findings are surprising based on the fact that resistance training has a very low energetic cost compared to aerobic training. Sleeping metabolic rate and free-living physical activity were unaltered in response to resistance training, despite an increase in fat free mass (2.1. kg). Thus, the increase in daily energy expenditure was due primarily to the resistance training program, and not due to an enhancing effect on resting and/or physical activity energy expenditure. On the other hand, Hunter and colleagues (24) found that 6-months of resistance training significantly increased daily energy expenditure in addition to the direct energy cost of the resistance training program. This increase was due to both an increase in resting metabolic rate and physical activity energy expenditure in older individuals when they were not exercising. The results are not directly comparable to the present investigation as our measures were conducted after the endurance and resistance training programs were completed. Although we cannot rule out that energetic adaptations may occur acutely *during* endurance and resistance training programs that may serve to acutely enhance the total energy cost of the exercise programs, we would suggest that these adaptations are probably short-lived.

One may suggest that we were overly optimistic to hypothesize that favorable changes in physiology (i.e., increase in VO_2 max and muscular strength) may result in a spontaneous increase in daily energy expenditure in inactive, young women. It is possible that additional behavioral interventions and counseling are required to alter the physical activity behavior patterns of young women once a structured and heavily supervised exercise program is terminated. Another potential reason for the absence of changes in daily energy expenditure in our population is a "ceiling effect." That is, although our subjects were not regularly participating in a regular physical activity program, our subjects were not impaired in their ability to participate in an exercise training program. Thus, it may be difficult to augment physical activity energy expenditure in individuals whose physical capacity is not limited by a poor fitness level. It is interesting to note that approximately one-third of the volunteers enrolled in our study dropped out for various reasons. The primary reason for the dropouts was non-compliance, in which women failed to maintain or lost interest in participating in a regular exercise training program. The physiological characteristics of these women (ie, baseline body weight, fitness, etc) were similar to those who completed our study. Thus, we were unable to identify physiological characteristics that may have predicted non-compliance in our study.

One limitation of the study pertains to doubly labeled water measurement that needs to occur over a 10-day period. It has been shown that after 3 days, a detraining effect on RMR can be observed (40) and it is possible that the lack of a stimulation effect of exercise on total energy expenditure may reflect a partially detraining effect over the 10-day period. However, resting energy expenditure was measured within 72 hours of the last exercise session; thus we would suggest that the acute effects of exercise had probably dissipated but that a detraining effect had not completely occurred yet.

In conclusion, our results demonstrate that chronic training does not alter daily energy expenditure or its components after the end of the exercise program. The energy enhancing benefits derived from endurance or resistance training are probably short-lived and derived primarily from the direct energy cost of the physical activity and not from a chronic elevation in daily energy expenditure in young women.

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Table 1. Physical characteristics pre and post 6-month training intervention in 48 young, non-obese, sedentary women.

Physical characteristics	Aerobic training n=13		Resistance training n=16		Control condition n=19	
	Pre	Post	Pre	Post	Pre	Post
Age (yrs)	28 ± 4	-	28 ± 3	-	28 ± 4	-
Height (cm)	163 ± 5	163 ± 5	164 ± 7	164 ± 7	165 ± 6	165 ± 6
Weight (kg)*	58 ± 5	60 ± 5	58 ± 6	59 ± 5	61 ± 7	62 ± 8
BMI (km/m^2)	22.0 ± 2.0	22.1 ± 1.9	21.6 ± 2.3	22.2 ± 2.2	22.1 ± 1.8	22.4 ± 2.1
Fat mass (kg)	14.5 ± 4.4	14.7 ± 3.6	15.8 ± 3.6	15.7 ± 2.9	17.1 ± 6.1	17.3 ± 6.0
Fat-free mass (kg)	40.2 ± 4.1	40.9 ± 3.9	39.2 ± 4.1	40.5 ± 3.4[a]	41.4 ± 3.9	41.2 ± 3.6
VO_2max (L/min)	2.2 ± 0.5	2.6 ± 0.6[a]	2.1 ± 0.3	2.2 ± 0.3	2.3 ± 0.5	2.4 ± 0.4

Values are means ± SD.
[a] $p<0.05$
* The difference between total body weight and the sum of fat mass and fat-free mass is bone mass.

Table 2. Energy expenditure data pre and post 6 month training intervention in young, non-obese, sedentary women.

Energy Expenditure Component	**Endurance Training (n=13)**		**Resistance Training (n=16)**		**Control (n=19)**	
	Pre	Post	Pre	Post	Pre	Post
Total Daily Energy Expenditure (kcal/day)	2581 ± 530	2599 ± 440	2473 ± 429	2364 ± 285	2573 ± 355	2610 ± 426
Resting Metabolic Rate (kcal/day)	1388 ± 78	1362 ± 137	1351 ± 127	1411 ± 114[a]	1401 ± 140	1432 ± 166
Physical Activity Energy Expenditure(kcal/day)	943 ± 429	976 ± 406	845 ± 425	694 ± 248	928 ± 258	946 ± 289
Respiratory Quotient	0.83 ± 0.03	0.87 ± 0.08	0.85 ± 0.02	0.85 ± 0.03	0.83 ± 0.04	0.85 ± 0.04

Values are the means ± SD.
[a] $p<0.05$

APPENDIX IV

	DOB	Age	Ethnic	group	orcon	Start	Status	Pre Date	Post Date	MONW	Geno #	Geno	LMP_1	LMP-2	fh_dm
Type:	Integer	Integer	String	Integer	Integer	Long I...	Integer	Long Integer	Long Integer	Integer	Integer	String	Long Inte...	Long Int...	Integer
Source:	User E...	User ...	User Ent...	User En...	User En...	User E...	User Ent...	User Entered	User Entered	User Ent...	User Ente...	User En...	User Ent...	User Ent...	User Ent...
Class:	Contin...	Conti...	Nominal	Continu...	Continu...	Contin...	Continuo...	Continuous	Continuous	Continuous	Continuous	Nominal	Continuous	Continuo...	Continuo...
Format:	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Dec. Places:	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Mean:	25138....	28.789	•	1.000	.368	35833....	2.000	35826.211	36044.526	1.737	700.813	•	36142.875	36207.250	.421
Std. Deviation:	1415.999	4.171	•	0.000	.496	309.741	0.000	316.835	345.204	.452	279.464	•	199.317	296.405	.507
Std. Error:	324.852	.957	•	0.000	.114	71.059	0.000	72.687	79.195	.104	69.866	•	70.469	85.565	.116
Variance:	2.005E6	17.398	•	0.000	.246	95939....	0.000	100384.731	119165.819	.205	78100.029	•	39727.268	87856.023	.257
Coeff. of Variation:	.056	.145	•	0.000	1.345	.009	0.000	.009	.010	.260	.399	•	.006	.008	1.205
Minimum:	22753	22		1	0	35485	2	35468	35570	1	232		35809	35741	0
Maximum:	27441	35		1	1	36343	2	36371	36581	2	1070		36371	36559	1
Range:	4688.000	13.000	•	0.000	1.000	858.000	0.000	903.000	1011.000	1.000	838.000	•	562.000	818.000	1.000
Count:	19	19	19	19	19	19	19	19	19	19	16	16	8	12	19
Missing Cells:	1	1	1	1	1	1	1	1	1	1	4	4	12	8	1
Sum:	477627	547.000	•	19.000	7.000	680843	38.000	680698.000	684846.000	33.000	11213.000	•	289143.000	434487.0...	8.000
Sum of Squares:	1.204E...	16061	•	19.000	7.000	2.44E10	76.000	24388636778	24687094654	61.000	9029711....	•	1.045E10	1.573E10	8.000

Endurance Group N=19

	DOB	Age	Ethnic	group	orcon	Start	Status	Pre Date	Post Date	MONW	Geno #	Geno	LMP_1	LMP-2	fh_dm
1	•	•		•	•	•	•	•	•	•	•		•	•	•
2	24455	32	w	1	0	35827	2	35821	36396	1	970	11	36167	36369	1
3	23762	33	w	1	0	35849	2	35832	36082	2	621	11	35809	36068	1
4	24423	30	w	1	1	35487	2	35468	35720	2	•		•	•	0
5	23521	33	w	1	1	35893	2	35880	36083	1	645	11	•	•	0
6	23616	33	w	1	1	35965	2	35965	36168	1	829	11	•	36157	1
7	27441	22	w	1	0	35709	2	35696	35909	1	506	11	•	35900	1
8	24020	33	w	1	0	36139	2	36139	36361	2	960	11	36120	36361	0
9	26478	24	w	1	1	35529	2	35517	35727	2	•		•	•	0
10	23344	33	w	1	0	35704	2	35691	35570	2	493	11	•	•	0
11	26562	26	w	1	1	36220	2	36215	36412	1	982	12	36194	36390	0
12	26795	24	w	1	0	35916	2	35907	36117	2	694	11	35890	36103	0
13	26796	23	h	1	0	35485	2	35472	35710	2	232	12	•	•	0
14	25912	28	w	1	0	36318	2	36315	36532	2	1020	11	36299	36525	1
15	25697	29	w	1	1	36343	2	36371	36565	2	1070	11	36371	36550	0
16	25912	26	w	1	0	35492	2	35480	35685	2	•		•	•	0
17	22753	35	w	1	1	35580	2	35570	35769	2	454	11	•	35764	1
18	24287	32	h	1	0	36318	2	36314	36581	2	1005	11	36293	36559	1
19	26053	25	w	1	0	35557	2	35544	35755	2	437	11	•	35741	1
20	25800	26	w	1	0	35512	2	35501	35704	2	295	12	•	•	0

	height1	weight1	BMI1	height2	weight2	BMI2	sbp_1	sbp_2	dbp_1	dbp_2	BMD total (g/cm2)	BMD total 2	BMC tot (g)
Type:	Real	Real	Real	Real	Real	Real	Integer	Real	Integer	Real	Real	Real	Integer
Source:	User Ente...	User Enter...	User E...	User Ente...	User Enter...	User E...	User Ent...	User Ent...	User Ent...	User Ent...	User Entered	User Entered	User Entered
Class:	Continuous	Continuous	Contin...	Continuous	Continuous	Contin...	Continuo...	Continuo...	Continuo...	Continuo...	Continuous	Continuous	Continuous
Format:	Free Form...	Free Form...	Free F...	Free Form...	Free Form...	Free F...	•	Free For...	•	Free For...	Free Format Fixed	Free Format Fi...	•
Dec. Places:	3	3	3	3	3	3	•	3	•	3	3	3	•
Mean:	162.742	57.979	21.896	162.763	58.521	22.107	112.105	•	63.895	•	1.169	1.178	2524.632
Std. Deviation:	5.290	6.545	2.272	5.442	6.544	2.330	10.949	•	9.533	•	.062	.060	270.547
Std. Error:	1.214	1.502	.521	1.249	1.501	.534	2.512	•	2.187	•	.014	.014	62.068
Variance:	27.984	42.841	5.163	29.619	42.818	5.427	119.877	•	90.877	•	.004	.004	73195.912
Coeff. of Variation:	.033	.113	.104	.033	.112	.105	.098	•	.149	•	.053	.051	.107
Minimum:	152.600	45.100	17.058	152.200	48.400	18.083	98	•	49	•	1.053	1.067	1999
Maximum:	172.200	70.500	25.461	172.800	75.300	27.195	137	•	82	•	1.274	1.273	3019
Range:	19.600	25.400	8.403	20.600	26.900	9.112	39.000	•	33.000	•	.221	.206	1020.000
Count:	19	19	19	19	19	19	19	0	19	0	19	19	19
Missing Cells:	1	1	1	1	1	1	1	20	1	20	1	1	1
Sum:	3092.100	1101.600	416.022	3092.500	1111.900	420.036	2130.000	0.000	1214.000	0.000	22.207	22.380	47968.000
Sum of Squares:	503718.570	64640.740	9202.119	503878.210	65840.290	9383.479	240942.0...	0.000	79204.000	0.000	26.026	26.426	122419054.000

	height1	weight1	BMI1	height2	weight2	BMI2	sbp_1	sbp_2	dbp_1	dbp_2	BMD total (g/cm2)	BMD total 2	BMC tot (g)
1	•	•	•	•	•	•	•	•	•	•	•	•	•
2	162.600	45.100	17.058	163.900	48.400	18.083	108	•	77	•	1.053	1.067	1999
3	156.800	61.300	24.933	156.800	62.200	25.299	115	•	62	•	1.257	1.254	2433
4	166.000	65.000	23.588	166.000	64.900	23.552	99	•	52	•	1.172	1.172	2744
5	166.600	66.300	23.887	166.800	66.400	23.866	108	•	61	•	1.239	1.236	2958
6	162.600	53.500	20.235	161.800	54.200	20.703	109	•	74	•	1.100	1.103	2350
7	159.000	55.200	21.835	159.000	55.400	21.914	100	•	62	•	1.112	1.124	2281
8	165.200	53.800	19.713	165.200	53.600	19.640	106	•	55	•	1.078	1.083	2187
9	161.200	56.600	21.800	161.200	57.100	21.974	98	•	60	•	1.159	1.195	2503
10	163.000	55.400	20.851	163.000	57.400	21.604	107	•	53	•	1.208	1.230	2805
11	167.700	55.900	19.877	167.600	54.500	19.402	137	•	72	•	1.145	1.161	2444
12	172.000	57.600	19.470	172.000	59.000	19.943	122	•	74	•	1.146	1.137	2680
13	163.400	54.000	20.225	163.400	53.400	20.000	130	•	68	•	1.245	1.222	2528
14	158.400	55.300	22.040	158.400	53.800	21.442	109	•	65	•	1.159	1.187	2415
15	166.400	70.500	25.461	166.400	75.300	27.195	103	•	49	•	1.220	1.251	2884
16	157.000	51.700	20.974	157.200	54.200	21.933	110	•	56	•	1.116	1.119	2289
17	163.800	66.300	24.711	163.800	65.400	24.375	129	•	75	•	1.156	1.177	2638
18	152.600	50.900	21.858	152.200	51.800	22.361	107	•	56	•	1.274	1.273	2383
19	155.600	60.800	25.112	155.000	60.500	25.182	121	•	82	•	1.151	1.177	2428
20	172.200	66.400	22.392	172.800	64.400	21.567	112	•	61	•	1.217	1.212	3019

	BMC tot 2	BMC trunk	BMC trunk2	BMC arms	BMC arms2	BMC legs	BMC legs2	BMD spine	BMD spine2	BMD pelvis
Type:	Real	Integer	Integer	Integer	Integer	Integer	Integer	Real	Real	Real
Source:	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	Free Format...	•	•	•	•	•	•	Free Format F...	Free Format Fix...	Free Format F...
Dec. Places:	3	•	•	•	•	•	•	3	3	3
Mean:	2448.803	936.421	877.684	329.316	303.579	799.421	854.789	1.220	1.252	1.129
Std. Deviation:	643.297	362.775	111.753	114.385	35.620	158.707	113.427	.111	.113	.093
Std. Error:	147.582	83.226	25.638	26.242	8.172	36.410	26.022	.025	.026	.021
Variance:	413830.407	131606.035	12488.784	13084.006	1268.813	25187.813	12865.731	.012	.013	.009
Coeff. of Variation:	.263	.387	.127	.347	.117	.199	.133	.091	.090	.082
Minimum:	2.264	602	645	248	241	314	713	.930	1.091	.952
Maximum:	2997.000	2350	1054	779	382	1032	1062	1.437	1.480	1.340
Range:	2994.736	1748.000	409.000	531.000	141.000	718.000	349.000	.507	.389	.388
Count:	19	19	19	19	19	19	19	19	19	19
Missing Cells:	1	1	1	1	1	1	1	1	1	1
Sum:	46527.264	17792.000	16676.000	6257.000	5768.000	15189.000	16241.000	23.173	23.791	21.455
Sum of Squares:	121385068....	19029712.000	14861060.000	2296041.000	1773882.000	12595787.000	14114219.000	28.484	30.019	24.383

	BMC tot 2	BMC trunk	BMC trunk2	BMC arms	BMC arms2	BMC legs	BMC legs2	BMD spine	BMD spine2	BMD pelvis
1	•	•	•	•	•	•	•	•	•	•
2	2051.000	602	645	248	241	713	722	.930	1.091	.952
3	2495.000	804	849	281	274	778	789	1.257	1.337	1.177
4	2789.000	915	975	332	325	992	993	1.175	1.124	1.098
5	2951.000	1030	993	336	336	1032	1055	1.324	1.388	1.189
6	2360.000	2350	771	305	310	788	827	1.157	1.228	1.018
7	2312.000	771	762	269	279	700	713	1.106	1.173	1.087
8	2.264	706	723	267	261	721	754	1.163	1.224	.998
9	2504.000	861	875	333	289	761	795	1.255	1.149	1.205
10	2889.000	965	1054	379	371	905	922	1.235	1.348	1.252
11	2516.000	784	820	290	288	860	893	1.241	1.287	1.088
12	2738.000	907	956	300	296	953	963	1.162	1.185	1.087
13	2534.000	792	840	304	291	761	805	1.127	1.184	1.130
14	2485.000	862	882	282	315	776	785	1.231	1.323	1.188
15	2926.000	1037	1009	289	313	1029	1062	1.385	1.480	1.157
16	2337.000	781	790	334	331	761	736	1.189	1.156	1.090
17	2717.000	911	975	324	310	841	858	1.304	1.156	1.118
18	2431.000	826	865	251	264	743	756	1.437	1.469	1.340
19	2493.000	790	867	779	292	314	810	1.196	1.246	1.066
20	2997.000	1098	1025	354	382	761	1003	1.299	1.243	1.215

	BMD pelvis2	total ca++	total ca++2	Tis_Fa1	Tis_Fa2	Regn % fat	Regn % fat2	F_mass1	F_mass2	FF_m1	FF_m2
Type:	Real	Integer	Integer	Real	Real	Real	Real	Real	Real	Real	Real
Source:	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Ente...	User Ente...
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	Free Format Fix...	•	•	Free Form...	Free Form...	Free Format F...	Free Format Fix...	Free Format ...	Free Format ...	Free For...	Free For...
Dec. Places:	3	•	•	3	3	3	3	3	3	3	3
Mean:	1.144	959.421	975.737	27.874	27.684	26.679	26.458	15.089	15.584	39.648	40.041
Std. Deviation:	.099	102.769	99.466	6.321	6.121	6.089	5.898	5.134	4.904	3.886	3.872
Std. Error:	.023	23.577	22.819	1.450	1.404	1.397	1.353	1.178	1.125	.891	.888
Variance:	.010	10561.368	9893.427	39.951	37.470	37.077	34.786	26.361	24.048	15.100	14.994
Coeff. of Variation:	.086	.107	.102	.227	.221	.228	.223	.340	.315	.098	.097
Minimum:	.951	760	779	16.200	19.100	15.400	18.100	6.500	10.315	33.005	33.773
Maximum:	1.303	1147	1139	37.800	40.200	36.300	38.600	24.591	28.851	47.769	48.637
Range:	.352	387.000	360.000	21.600	21.100	20.900	20.500	18.091	18.536	14.764	14.864
Count:	19	19	19	19	19	19	19	19	19	19	19
Missing Cells:	1	1	1	1	1	1	1	1	1	1	1
Sum:	21.731	18229.000	18539.000	529.600	526.000	506.900	502.700	286.696	296.101	753.315	760.772
Sum of Squares:	25.030	17679391.000	18267267.000	15481.020	15236.360	14190.950	13926.530	4800.532	5047.377	30139.354	30731.676

	BMD pelvis2	total ca++	total ca++2	Tis_Fa1	Tis_Fa2	Regn % fat	Regn % fat2	F_mass1	F_mass2	FF_m1	FF_m2
1	.	.	.	.	.	.	.	.	.	.	.
2	.951	760	779	16.800	22.700	16.100	21.700	7.422	10.446	36.800	35.634
3	1.234	925	948	33.800	34.200	32.400	32.800	19.747	20.650	38.726	39.767
4	1.113	1043	1060	25.600	25.800	24.500	24.700	15.880	16.193	46.089	46.452
5	1.199	1124	1122	31.000	32.900	29.600	31.400	19.295	20.400	42.927	41.557
6	1.019	893	897	22.700	20.600	21.700	19.700	11.621	10.315	39.587	39.753
7	1.044	867	878	27.500	24.800	26.400	23.700	14.160	13.105	37.290	39.823
8	.990	831	860	27.000	26.500	25.900	25.400	13.560	13.569	36.602	37.613
9	1.245	951	951	31.400	29.900	30.100	28.500	17.127	15.960	37.355	37.502
10	1.303	1066	1098	16.200	19.100	15.400	18.100	8.562	10.547	44.290	44.701
11	1.105	929	956	22.800	22.100	21.800	21.100	12.142	11.494	41.124	40.474
12	1.115	1019	1041	22.300	23.300	21.300	22.200	12.331	13.224	42.915	43.547
13	1.203	961	963	31.500	26.100	30.100	24.900	6.500	13.130	35.148	37.166
14	1.190	918	944	30.800	30.400	29.400	29.000	16.394	15.504	36.905	36.225
15	1.194	1096	1112	36.700	40.200	35.200	38.600	24.591	28.851	42.425	42.928
16	1.122	870	888	24.500	24.700	23.500	23.600	12.341	12.735	37.988	38.876
17	1.140	1002	1032	37.800	36.100	36.300	34.600	24.028	22.689	39.508	40.126
18	1.291	905	924	30.200	31.900	28.700	30.400	14.259	15.844	33.005	33.773
19	1.071	922	947	37.000	35.200	35.600	33.700	21.686	19.641	36.862	36.218
20	1.202	1147	1139	24.000	19.500	22.900	18.600	15.050	11.804	47.769	48.637

	LTM trunk	LTM trunk.2	LTM arms	LTM arms2	LTM legs	LTM legs2	Appen_1	Appen_2	FM_tr	FM_tr2	FM_arms	FM arms2
Type:	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real
Source:	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User En...	User Ent...	User Entered	User Entered
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continu...	Continuous	Continuous	Continuous
Format:	Free Format ...	Free Format Fi...	Free Format ...	Free Format Fi...	Free Format...	Free Format ...	Free Forma...	Free Forma...	Free Fo...	Free For...	Free Format...	Free Format ...
Dec. Places:	3	3	3	3	3	3	3	3	3	3	3	3
Mean:	19.302	19.559	4.162	4.109	13.519	13.850	17.681	17.959	6.589	6.535	1.617	1.428
Std. Deviation:	1.631	1.553	.559	.553	1.849	1.998	2.251	2.489	2.411	2.521	.976	.692
Std. Error:	.374	.356	.128	.127	.424	.458	.516	.571	.553	.578	.224	.159
Variance:	2.661	2.413	.313	.306	3.419	3.993	5.066	6.196	5.815	6.356	.952	.479
Coeff. of Variation:	.085	.079	.134	.135	.137	.144	.127	.139	.366	.386	.603	.485
Minimum:	16.548	17.362	3.150	3.359	10.729	10.709	13.879	14.135	1.984	3.454	.539	.650
Maximum:	22.959	23.234	4.978	5.367	16.970	18.678	21.869	24.045	11.304	12.451	4.607	3.583
Range:	6.411	5.872	1.828	2.008	6.241	7.969	7.990	9.910	9.320	8.997	4.068	2.933
Count:	19	19	19	19	19	19	19	19	19	19	19	19
Missing Cells:	1	1	1	1	1	1	1	1	1	1	1	1
Sum:	366.739	371.617	79.070	78.071	256.862	263.144	335.932	341.215	125.196	124.173	30.716	27.127
Sum of Squares:	7126.722	7311.806	334.682	326.298	3534.075	3716.344	6030.676	6239.298	929.622	925.930	66.786	47.356

	LTM trunk	LTM trunk.2	LTM arms	LTM arms2	LTM legs	LTM legs2	Appen_1	Appen_2	FM_tr	FM_tr2	FM_arms	FM arms2
1	.	.	.	.	.	.	.	.	.	.	.	.
2	17.614	17.699	3.376	3.359	13.017	12.054	16.393	15.413	1.984	3.454	.539	.650
3	19.562	20.753	3.809	3.615	12.737	12.625	16.546	16.240	9.836	11.018	1.982	1.871
4	21.471	23.234	4.872	4.699	16.669	15.930	21.541	20.629	6.182	6.937	1.445	1.390
5	20.865	19.627	4.237	4.084	15.463	15.569	19.700	19.653	8.582	8.633	1.611	1.643
6	19.741	18.618	4.557	4.371	12.727	14.271	17.284	18.642	4.444	3.511	.948	.873
7	18.984	19.608	3.701	4.082	11.748	13.101	15.449	17.183	6.491	5.593	1.235	1.147
8	18.301	18.358	3.723	3.608	11.884	12.596	15.607	16.204	5.600	5.619	1.155	1.168
9	18.127	18.026	4.282	3.665	12.339	13.305	16.621	16.970	7.227	6.498	1.615	1.416
10	20.904	21.264	4.953	4.964	15.239	15.708	20.192	20.672	3.077	3.986	.794	.855
11	19.451	19.293	4.043	3.870	14.527	14.293	18.570	18.163	5.256	4.743	.941	.973
12	20.257	20.717	4.607	4.412	15.610	16.080	20.217	20.492	4.231	4.894	4.607	1.102
13	17.207	19.963	3.931	3.621	11.221	11.644	15.152	15.265	6.500	5.423	1.385	1.063
14	18.482	18.059	3.371	3.718	12.703	12.165	16.074	15.883	6.945	6.638	1.140	1.219
15	20.946	20.175	4.033	4.544	15.214	15.942	19.247	20.486	11.304	12.451	1.972	3.583
16	18.300	19.121	4.332	4.266	12.720	12.836	17.052	17.102	5.751	5.462	1.073	1.307
17	19.095	20.112	4.978	4.575	13.003	13.161	17.981	17.736	10.029	9.539	3.356	2.473
18	16.548	17.362	3.150	3.426	10.729	10.709	13.879	14.135	6.441	7.153	1.298	1.520
19	17.925	17.841	4.216	3.825	12.342	12.477	16.558	16.302	9.377	8.555	2.524	2.047
20	22.959	21.787	4.899	5.367	16.970	18.678	21.869	24.045	5.939	4.066	1.096	.827

	FM legs	FM legs2	FM_per1	FM_per2	VO2_l1	VO2_l2	V02_kg1	VO2_kg2	max hr	max hr2	max RQ	max RQ2	LTA
Type:	Real	Real	Real	Real	Real	Real	Real	Real	Integer	Integer	Real	Real	Real
Source:	User Enter...	User Entered	User Entered	User Entered	User Ente...	User Ente...	User Entered	User Entered	User Ent...	User Enter...	User Enter...	User Entered ·	User ...
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Conti...
Format:	Free Form...	Free Format...	Free Forma...	Free Forma...	Free For...	Free For...	Free Forma...	Free Format...	•	•	Free Form...	Free Format...	Free ...
Dec. Places:	3	3	3	3	3	3	3	3	•	•	3	3	3
Mean:	6.307	6.359	7.924	7.787	2.113	2.537	38.882	43.400	190.053	188.737	1.155	1.163	321.078
Std. Deviation:	1.625	1.696	2.269	2.347	.515	.513	6.274	6.733	7.176	9.808	.053	.048	325.067
Std. Error:	.373	.389	.520	.539	.118	.121	1.439	1.545	1.646	2.250	.012	.011	83.932
Variance:	2.640	2.876	5.147	5.510	.265	.263	39.366	45.335	51.497	96.205	.003	.002	1.057...
Coeff. of Variation:	.258	.267	.286	.301	.244	.202	.161	.155	.038	.052	.045	.041	1.012
Minimum:	3.702	4.612	4.487	5.467	1.573	1.858	29.900	34.300	175	170	1.060	1.050	0.000
Maximum:	9.817	11.156	12.328	14.739	3.466	3.793	52.200	58.900	201	201	1.270	1.230	1300....
Range:	6.115	6.544	7.841	9.272	1.893	1.935	22.300	24.600	26.000	31.000	.210	.180	1300....
Count:	19	19	19	19	19	18	19	19	19	19	19	18	15
Missing Cells:	1	1	1	1	1	2	1	1	1	1	1	2	5
Sum:	119.841	120.829	150.557	147.956	40.156	45.666	738.759	824.594	3611.000	3586.000	21.940	20.930	4816....
Sum of Squares:	803.400	820.173	1285.673	1251.345	89.639	120.327	29433.048	36603.121	687207.0...	678542.000	25.385	24.376	3.026...

	FM legs	FM legs2	FM_per1	FM_per2	VO2_l1	VO2_l2	V02_kg1	VO2_kg2	max hr	max hr2	max RQ	max RQ2	LTA
1	•	•	•	•	•	•	•	•	•	•	•	•	•
2	3.948	5.076	4.487	5.726	1.651	2.101	36.600	43.400	187	201	1.130	1.140	74.300
3	6.598	6.442	8.580	8.313	1.833	2.133	29.900	34.300	183	170	1.150	1.160	215.000
4	6.742	6.581	8.187	7.971	1.800	3.135	44.338	48.300	188	179	1.140	1.200	•
5	7.861	8.703	9.472	10.346	2.433	2.756	36.700	41.500	175	173	1.160	1.160	1300
6	5.124	4.875	6.072	5.748	1.899	1.924	35.500	35.500	197	197	1.110	1.110	•
7	5.299	5.249	6.534	6.396	2.015	2.764	36.500	49.900	196	196	1.180	1.170	90.000
8	5.706	5.553	6.861	6.721	1.762	2.085	32.750	38.900	193	183	1.060	1.130	0.000
9	6.823	6.684	8.438	8.100	1.800	2.918	42.509	51.100	197	197	1.130	1.110	478.000
10	3.702	4.612	4.496	5.467	2.554	2.910	46.100	50.700	201	200	1.150	1.110	•
11	5.042	4.814	5.983	5.787	2.320	2.185	41.500	40.100	194	182	1.230	1.230	236.090
12	5.855	5.976	10.462	7.078	2.678	2.956	46.500	50.100	187	187	1.120	1.180	281.000
13	6.725	5.434	8.110	6.497	1.831	1.858	33.900	34.800	193	198	1.220	1.200	724.000
14	6.893	6.544	8.033	7.763	1.659	•	30.000	45.000	177	189	1.210	•	64.970
15	9.817	11.156	11.789	14.739	3.017	2.794	42.800	37.100	184	179	1.180	1.230	204.800
16	4.550	4.942	5.623	6.249	2.264	2.369	43.800	43.700	200	200	1.120	1.190	•
17	8.972	8.904	12.328	11.377	1.800	2.245	35.143	37.294	186	188	1.150	1.050	223.000
18	5.374	5.997	6.672	7.517	1.573	2.036	30.900	39.300	194	198	1.270	1.220	287.010
19	8.216	7.673	10.740	9.720	1.800	2.704	41.118	44.700	191	190	1.070	1.160	261.000
20	6.594	5.614	7.690	6.441	3.466	3.793	52.200	58.900	188	179	1.160	1.180	377.000

	LTA2	VO2_1	VO2_2	VCO2_1	VCO2_2	RMR_1	RMR_2	RQ	RQ2	M_abs1	M_corr1	M_abs2	M_corr2	M_FFM1
Type:	Real	Integer	Integer	Integer	Integer	Integer	Integer	Real	Real	Real	Real	Real	Real	Real
Source:	User E...	User Ent...	User Ent...	User Entered	User Entered	User Ente...	User Ente...	User ...	User E...	User Enter...	User Enter...	User Enter...	User Enter...	User Entered
Class:	Continu...	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Conti...	Contin...	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	Free Fo...	•	•	•	•	•	•	Free ...	Free F...	Free Form...	Free Form...	Free Form...	Free Form...	Free Form...
Dec. Places:	3	•	•	•	•	•	•	3	3	3	3	3	3	3
Mean:	355.489	198.737	200.947	168.421	172.211	1362.895	1382.105	.851	5.289	406.474	404.663	437.497	447.539	10.228
Std. Deviation:	147.241	18.399	20.630	11.848	16.209	119.899	135.383	.037	19.303	113.342	114.815	149.870	152.305	2.840
Std. Error:	35.711	4.221	4.733	2.718	3.719	27.507	31.059	.008	4.428	26.002	26.340	35.325	35.899	.652
Variance:	21679....	338.538	425.608	140.368	262.731	14375.877	18328.655	.001	372.608	12846.454	13182.424	22461.123	23196.894	8.068
Coeff. of Variation:	.414	.093	.103	.070	.094	.088	.098	.043	3.650	.279	.284	.343	.340	.278
Minimum:	142.600	170	159	149	146	1170	1160	.770	.780	215.980	199.541	194.000	199.776	4.852
Maximum:	727.000	235	246	193	221	1580	1720	.910	85.000	615.700	626.990	670.290	690.645	16.505
Range:	584.400	65.000	87.000	44.000	75.000	410.000	560.000	.140	84.220	399.720	427.449	476.290	490.869	11.653
Count:	17	19	19	19	19	19	19	19	19	19	19	18	18	19
Missing Cells:	3	1	1	1	1	1	1	1	1	1	1	2	2	1
Sum:	6043.320	3776.000	3818.000	3200.000	3272.000	25895.000	26260.000	16.170	100.490	7722.997	7688.589	7874.940	8055.696	194.341
Sum of Squares:	2.495E6	756524.0...	774878.0...	541474.000	568202.000	35550925	36624000	13.786	7238.4...	3370429.995	3348568.246	3827099.085	3999582.678	2133.042

	LTA2	VO2_1	VO2_2	VCO2_1	VCO2_2	RMR_1	RMR_2	RQ	RQ2	M_abs1	M_corr1	M_abs2	M_corr2	M_FFM1
1	•	•	•	•	•	•	•	•	•	•	•	•	•	•
2	517.900	172	193	154	162	1190	1320	.900	.840	282.830	261.712	204.000	210.082	7.112
3	508.000	203	198	174	171	1400	1370	.850	.860	326.540	332.336	407.950	420.275	8.582
4	281.000	235	231	181	188	1580	1570	.770	.820	451.300	459.467	436.700	449.905	9.969
5	378.300	213	213	176	175	1450	1450	.830	.820	309.400	314.871	454.280	468.023	7.335
6	250.600	202	197	165	164	1370	1350	.820	.830	279.420	284.321	345.290	355.697	7.182
7	142.600	177	211	157	182	1230	1450	.880	.860	246.140	250.409	287.110	295.736	6.715
8	216.000	205	159	170	178	1400	1160	.830	1.130	408.920	419.593	558.710	518.280	11.464
9	•	195	195	165	171	1340	1350	.850	.870	482.000	490.750	550.710	567.405	13.137
10	•	199	193	167	159	1365	1320	.840	.830	489.000	497.883	550.260	566.941	11.241
11	453.000	184	196	164	176	1270	1360	.890	.890	215.980	199.541	194.000	199.776	4.852
12	366.000	192	220	159	172	1310	1480	.830	.780	514.270	523.633	279.420	287.811	12.202
13	727.000	181	169	151	146	1230	1160	.840	.870	303.400	308.757	406.000	418.265	8.784
14	343.000	187	211	164	172	1290	1440	.880	.810	479.970	445.052	293.000	301.806	12.059
15	276.600	213	216	193	185	1490	1480	.910	.860	574.857	533.297	•	•	12.570
16	367.000	210	194	176	158	1440	1320	.840	.810	615.700	626.990	660.140	680.184	16.505
17	340.000	227	246	186	221	1550	1720	.820	.900	444.570	452.609	670.290	690.645	11.456
18	260.320	170	176	149	150	1170	1210	.880	85.000	380.560	352.601	472.000	486.285	10.683
19	154.000	189	192	169	166	1310	1320	.900	.870	463.430	471.827	459.680	473.588	12.800
20	462.000	222	208	180	176	1510	1430	.810	.840	454.710	462.941	645.400	664.993	9.691

	M_FFM2	Fasting Ins 1	Fasting Ins 2	Ins_1	Ins_2	Glu - 10' 1	Glu 0' 1	Glu 30' 1	Glu 60' 1	Glu 90' 1	Glu 120' 1	Ave Glu 1
Type:	Real	Real	Real	Real	Real	Integer	Integer	Real	Real	Real	Real	Real
Source:	User Entered	User Entered	User Entered	User En...	User En...	User Entered	User Enter...	User Entered	User Entered	User Entered	User Entered	User Entered
Class:	Continuous	Continuous	Continuous	Continu...	Continu...	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	Free Form...	Free Format Fixed	Free Format Fixed	Free Fo...	Free Fo...	•	•	Free Forma...	Free Forma...	Free Forma...	Free Format ...	Free Format...
Dec. Places:	3	3	3	3	3	•	•	3	3	3	3	3
Mean:	11.242	13.336	7.583	69.263	74.825	76.111	75.611	75.679	76.532	76.488	76.347	76.303
Std. Deviation:	3.746	18.091	2.631	11.240	15.575	4.813	4.104	4.614	4.516	4.394	3.980	3.621
Std. Error:	.883	5.455	.877	2.579	3.671	1.134	.967	1.059	1.036	1.008	.913	.831
Variance:	14.036	327.296	6.921	126.333	242.583	23.163	16.840	21.292	20.393	19.304	15.840	13.113
Coeff. of Variation:	.333	1.357	.347	.162	.208	.063	.054	.061	.059	.057	.052	.047
Minimum:	4.936	5.700	5.250	47.230	52.600	69	67	67.660	68.500	70.000	71.000	70.280
Maximum:	17.496	67.450	13.200	87.500	122.000	87	83	83.500	85.660	87.160	84.160	82.740
Range:	12.560	61.750	7.950	40.270	69.400	18.000	16.000	15.840	17.160	17.160	13.160	12.460
Count:	18	11	9	19	18	18	18	19	19	19	19	19
Missing Cells:	2	9	11	1	2	2	2	1	1	1	1	1
Sum:	202.364	146.700	68.250	1315.999	1346.855	1370.000	1361.000	1437.910	1454.110	1453.270	1450.600	1449.750
Sum of Squares:	2513.666	5229.400	572.928	93424.1...	104902....	104666.000	103193.000	109203.524	111653.168	111505.034	111034.620	110855.774

	M_FFM2	Fasting Ins 1	Fasting Ins 2	Ins_1	Ins_2	Glu - 10' 1	Glu 0' 1	Glu 30' 1	Glu 60' 1	Glu 90' 1	Glu 120' 1	Ave Glu 1
1	•	•	•	•	•	•	•	•	•	•	•	•
2	5.896	•	•	59.333	66.366	69	71	75.330	78.000	72.830	71.660	75.450
3	10.568	8.250	•	57.830	74.300	87	83	76.160	83.500	87.160	84.160	82.740
4	9.685	•	5.600	78.000	71.000	75	72	75.160	71.000	78.500	71.000	73.910
5	11.262	7.700	6.600	66.230	81.270	75	76	83.500	76.660	74.160	78.660	78.240
6	8.948	•	7.000	66.200	68.700	•	70	78.660	77.000	76.830	81.330	78.450
7	7.426	•	•	47.230	54.600	78	78	75.000	85.660	79.500	79.830	79.990
8	13.779	8.250	9.850	65.460	77.460	69	67	70.160	72.160	76.000	71.830	72.530
9	15.130	7.100	•	64.930	86.700	72	74	72.660	73.660	74.160	74.500	73.740
10	12.683	•	•	53.860	52.600	70	•	67.660	68.500	72.830	72.660	70.280
11	4.936	9.000	9.000	66.933	71.533	78	78	80.160	83.500	83.660	80.000	81.830
12	6.609	5.900	5.250	84.930	76.970	80	79	81.500	78.000	77.500	82.330	79.830
13	11.254	5.700	5.600	73.000	122.000	81	80	82.660	81.000	82.830	76.660	80.780
14	8.331	14.000	13.200	82.933	57.066	80	79	74.330	77.330	73.500	76.000	75.290
15	•	•	•	73.760	•	71	73	73.660	72.330	74.160	75.160	73.820
16	17.496	67.450	•	70.000	80.000	79	77	77.660	74.330	74.660	77.500	76.030
17	17.212	•	•	70.170	89.730	76	74	70.830	77.660	75.160	74.500	74.530
18	14.399	7.250	•	87.500	77.460	78	79	77.000	73.330	71.500	71.160	73.240
19	13.076	6.100	6.150	60.700	65.100	73	73	67.660	74.330	70.000	73.500	71.370
20	13.673	•	•	87.000	74.000	79	78	78.160	76.160	78.330	78.160	77.700

	Glu -10' 2	Glu 0' 2	Glu 30' 2	Glu 60' 2	Glu 90' 2	Glu 120' 2	Ave Glu 2	Chol_1	Trig_1	HDL_1	LDL_1	Ch_HDL1	ins_0
Type:	Integer	Integer	Real	Real	Real	Real	Real	Integer	Integer	Integer	Integer	Real	Real
Source:	User Entered	User Ente...	User Entered	User Entered	User Entered	User Entered	User Entered	User Ente...	User Ent...	User Ente...	User Ent...	User Entered	User En...
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuo...	Continuous	Continuous	Continuous	Continu...
Format:	•	•	Free Forma...	Free Forma...	Free Forma...	Free Format ...	Free Format...	•	•	•	•	Free Format ...	Free Fo...
Dec. Places:	•	•	3	3	3	3	3	•	•	•	•	3	3
Mean:	76.789	76.211	75.234	78.312	90.703	92.755	84.735	191.316	96.211	58.789	113.316	3.503	7.413
Std. Deviation:	4.417	3.735	5.495	4.053	50.522	61.755	28.461	27.029	30.983	19.269	23.898	.939	2.336
Std. Error:	1.013	.857	1.261	.930	11.591	14.556	6.708	6.201	7.108	4.421	5.483	.216	.536
Variance:	19.509	13.953	30.198	16.428	2552.516	3813.658	810.038	730.561	959.953	371.287	571.117	.883	5.456
Coeff. of Variation:	.058	.049	.073	.052	.557	.666	.336	.141	.322	.328	.211	.268	.315
Minimum:	66	70	65.330	70.160	67.250	68.660	73.620	152	38	33	79	2.072	5.000
Maximum:	83	83	86.160	85.660	298.500	339.660	198.120	245	153	111	178	5.200	13.800
Range:	17.000	13.000	20.830	15.500	231.250	271.000	124.500	93.000	115.000	78.000	99.000	3.128	8.800
Count:	19	19	19	19	19	18	18	19	19	19	19	19	19
Missing Cells:	1	1	1	1	1	2	2	1	1	1	1	1	1
Sum:	1459.000	1448.000	1429.440	1487.920	1723.360	1669.590	1525.230	3635.000	1828.000	1117.000	2153.000	66.558	140.850
Sum of Squares:	112387.000	110604.000	108085.597	116817.074	202259.481	219695.005	143011.007	708583.000	193152.0...	72351.000	254249.0...	249.042	1142.343

	Glu -10' 2	Glu 0' 2	Glu 30' 2	Glu 60' 2	Glu 90' 2	Glu 120' 2	Ave Glu 2	Chol_1	Trig_1	HDL_1	LDL_1	Ch_HDL1	ins_0
1	•	•	•	•	•	•	•	•	•	•	•	•	•
2	71	70	74.000	80.330	298.500	339.660	198.120	178	66	61	104	2.918	6.000
3	83	83	86.160	84.000	85.500	78.000	83.410	173	136	67	79	2.582	8.600
4	73	74	71.330	80.500	76.500	73.160	75.370	158	101	36	102	4.400	5.000
5	74	74	79.330	77.830	78.160	79.660	78.740	230	153	111	88	2.072	10.050
6	74	73	73.330	77.160	75.330	68.660	73.620	196	87	77	102	2.545	10.000
7	80	77	76.660	76.830	82.830	77.830	78.530	177	71	52	111	3.404	5.000
8	75	73	74.000	76.160	77.000	78.000	76.040	199	60	60	127	3.317	6.100
9	76	74	69.830	76.830	77.330	79.830	75.950	194	116	37	134	5.200	7.100
10	66	76	77.500	74.160	76.330	79.160	76.780	166	61	59	95	2.814	5.000
11	75	72	78.000	77.160	81.160	79.330	78.910	228	95	64	145	3.563	8.100
12	78	74	80.830	83.160	76.660	74.500	78.780	245	73	52	178	4.712	7.800
13	79	81	81.000	77.660	88.160	87.500	83.580	152	119	35	93	4.300	9.000
14	82	81	82.160	85.660	83.330	83.160	83.570	187	85	65	105	2.900	13.800
15	76	72	70.660	70.160	67.250	•	•	204	123	82	97	2.500	7.900
16	81	80	65.500	73.500	79.000	81.660	74.910	213	101	47	146	4.500	5.000
17	78	80	65.330	76.830	80.160	77.830	75.030	222	132	74	122	3.000	6.200
18	82	79	77.660	78.160	79.500	80.830	79.030	188	82	62	110	3.032	9.100
19	82	79	73.000	85.500	83.500	76.160	79.540	168	129	33	109	5.100	6.100
20	74	76	73.160	76.330	77.160	74.660	75.320	157	38	43	106	3.700	5.000

	ins_120	glu_0	glu_120	L2sc_1	L2sc_2	L2vis_1	L2vis_2	L4sc_1	L4sc_2	L4vis_1	L4vis_2	RTatt_1	RTatt_2
Type:	Real	Integer	Integer	Integer	Integer	Integer	Integer	Long Inte...	Long Inte...	Integer	Integer	Real	Real
Source:	User Entered	User En...	User Entered	User Ente...	User Ente...	User Enter...	User Enter...	User Ente...	User Ente...	User Enter...	User Enter...	User Enter...	User Enter...
Class:	Continuous	Continu...	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	Free Form...	•	•	•	•	•	•	•	•	•	•	Free Form...	Free Form...
Dec. Places:	3	•	•	•	•	•	•	•	•	•	•	3	3
Mean:	38.089	78.368	91.053	10065.769	9581.222	3757.692	3721.222	18480.118	19027.600	4040.118	4054.133	49.875	51.668
Std. Deviation:	18.160	4.669	16.962	5807.974	5357.222	2043.683	1864.798	8089.867	7618.254	1055.460	1217.486	2.583	2.056
Std. Error:	4.166	1.071	3.891	1610.842	1262.709	566.816	439.537	1962.081	1967.025	255.987	314.354	.646	.472
Variance:	329.779	21.801	287.719	3.373E7	2.87E7	4176641.7...	3477471.4...	65445955....	5.804E7	1113996.1...	1482273.2...	6.671	4.229
Coeff. of Variation:	.477	.060	.186	.577	.559	.544	.501	.438	.400	.261	.300	.052	.040
Minimum:	17.200	71	68	2235	2326	1236	1636	7264	8053	2294	2478	44.400	46.800
Maximum:	71.000	87	133	19509	20461	8590	9454	34578	34305	6173	7259	53.500	55.100
Range:	53.800	16.000	65.000	17274.000	18135.000	7354.000	7818.000	27314.000	26252.000	3879.000	4781.000	9.100	8.300
Count:	19	19	19	13	18	13	18	17	15	17	15	16	19
Missing Cells:	1	1	1	7	2	7	2	3	5	3	5	4	1
Sum:	723.700	1489.000	1730.000	130855.000	172462.000	48850.000	66982.000	314162.000	285414.000	68682.000	60812.000	798.000	981.700
Sum of Squares:	33501.370	117083....	162700.000	1721946963	2140293836	233682970	308371922	6852886002	6243272466	295307298	267291782	39900.320	50799.010

	ins_120	glu_0	glu_120	L2sc_1	L2sc_2	L2vis_1	L2vis_2	L4sc_1	L4sc_2	L4vis_1	L4vis_2	RTatt_1	RTatt_2
1	•	•	•	•	•	•	•	•	•	•	•	•	•
2	17.200	74	72	2235	2326	1236	1636	7264	•	3140	•	50.900	52.800
3	42.700	85	99	19509	20344	8590	9454	34578	34305	5791	7259	49.800	50.600
4	63.000	78	89	•	7342	•	4712	17093	17340	3853	5078	•	51.500
5	71.000	79	111	15518	13625	2506	2234	24221	26059	4174	3525	47.600	50.200
6	47.600	77	133	5572	4470	2880	2421	13539	13068	3539	3299	51.400	51.800
7	61.000	76	114	7904	7484	4852	3416	19810	20239	4416	4666	52.500	52.400
8	63.700	73	101	9407	8934	4036	2508	20798	•	4635	•	48.000	46.800
9	59.400	87	104	•	12292	•	3587	•	20720	•	3224	•	51.800
10	41.800	80	102	4958	5102	2061	3415	9809	8433	3558	3845	51.700	49.900
11	18.400	77	87	6827	5143	2786	2597	14192	13073	3530	3568	53.500	51.900
12	30.000	84	74	3988	4844	1591	2683	8120	8053	3188	3642	51.100	51.000
13	23.000	80	88	•	7601	•	3061	14324	16507	2294	2478	50.900	54.000
14	18.300	81	68	10137	•	2539	•	21135	•	5145	•	52.000	55.000
15	26.100	72	93	16523	20461	5237	6275	•	•	•	•	49.100	48.200
16	18.000	77	74	•	11508	•	2915	12756	19587	2397	3365	50.200	52.800
17	27.200	85	75	19182	14936	5417	4563	34014	29311	6173	4566	44.700	52.400
18	33.800	71	82	9095	9530	5119	4976	18743	20924	4359	4366	50.200	55.100
19	21.500	80	86	•	12698	•	4425	27934	26067	4581	5332	44.400	52.600
20	40.000	73	78	•	3822	•	2104	15832	11728	3909	2599	•	50.900

	LTatt_1	LTatt_2	Avatt_1	Avatt_2	RTarea_1	RTarea_2	LTarea_1	LTarea_2	RTsc_1	RTsc_2	LTsc_1	LTsc_2	Thi_sc1
Type:	Real	Real	Real	Real	Integer	Integer	Integer	Integer	Integer	Integer	Real	Integer	Real
Source:	User Ente...	User Ente...	User Ente...	User Ente...	User Entered	User Entered	User Entered	User Entered	User Enter...	User Enter...	User Ente...	User Ente...	User Enter...
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	Free Form...	Free Form...	Free For...	Free For...	•	•	•	•	•	•	Free Form...	•	Free Form...
Dec. Places:	3	3	3	3	•	•	•	•	•	•	3	•	3
Mean:	49.069	50.911	50.342	51.287	10693.750	11153.263	10451.938	10879.632	9954.688	9378.632	9340.514	9351.737	9647.601
Std. Deviation:	2.654	2.053	1.938	1.994	1427.267	1594.620	1390.272	1443.747	2911.670	2182.426	3827.802	2198.184	3218.394
Std. Error:	.664	.471	.457	.457	356.817	365.831	347.568	331.218	727.918	500.683	956.950	504.298	804.598
Variance:	7.045	4.213	3.754	3.976	2037092.067	2542813.094	1932856.063	2084406.690	8477825.0...	4762981.3...	1.465E7	4832011.5...	10358057....
Coeff. of Variation:	.054	.040	.038	.039	.133	.143	.133	.133	.292	.233	.410	.235	.334
Minimum:	43.200	47.500	46.733	47.400	8750	8941	8221	8593	5823	5880	79.220	5468	4391.610
Maximum:	52.600	54.900	53.400	55.000	13611	14021	12865	13266	16157	14387	15872.000	14611	16014.500
Range:	9.400	7.400	6.667	7.600	4861.000	5080.000	4644.000	4673.000	10334.000	8507.000	15792.780	9143.000	11622.890
Count:	16	19	18	19	16	19	16	19	16	19	16	19	16
Missing Cells:	4	1	2	1	4	1	4	1	4	1	4	1	4
Sum:	785.100	967.300	906.150	974.450	171100.000	211912.000	167231.000	206713.000	159275.000	178194.000	149448.220	177683.000	154361.610
Sum of Squares:	38629.550	49321.590	45680.921	50048.027	1860257006....	2409280938....	1776880801	2286480603	1712700227	1756949540	1.616E9	1748620865	1.645E9

	LTatt_1	LTatt_2	Avatt_1	Avatt_2	RTarea_1	RTarea_2	LTarea_1	LTarea_2	RTsc_1	RTsc_2	LTsc_1	LTsc_2	Thi_sc1
1	•	•	•	•	•	•	•	•	•	•	•	•	•
2	49.100	53.100	50.933	52.950	8750	8941	8221	8788	8704	8906	79.220	8753	4391.610
3	49.500	50.300	49.967	50.450	11292	11122	10728	11076	11798	14387	12801.000	14611	12299.500
4	•	49.500	51.500	50.500	•	14021	•	13129	•	8186	•	8195	•
5	48.300	48.400	48.700	49.300	11161	11936	11477	12052	10624	12240	10525.000	12509	10574.500
6	49.900	51.100	51.033	51.450	10721	10426	9939	10336	6785	9030	6638.000	9077	6711.500
7	49.800	49.800	51.567	51.100	11333	11341	11142	11142	8757	9211	9269.000	9601	9013.000
8	47.900	48.000	47.675	47.400	9922	10541	9875	10542	10240	10503	10666.000	10505	10453.000
9	•	51.900	•	51.800	•	10045	•	10178	•	8000	•	7793	•
10	51.400	49.800	51.000	49.850	12865	13159	12607	12902	5823	5880	5090.000	5468	5456.500
11	52.600	51.700	52.667	51.800	10787	10386	10644	10437	10770	10339	10806.000	10408	10788.000
12	49.200	50.400	50.433	50.700	12251	12768	12104	12513	6486	8065	6725.000	8111	6605.500
13	49.100	53.400	51.333	53.700	9005	9516	8751	9057	13115	8294	12459.000	8174	12787.000
14	52.400	54.200	53.400	54.600	9958	10371	9323	9446	9907	10326	9065.000	9404	9486.000
15	47.100	47.500	47.975	47.850	13611	13394	12865	12111	13174	12935	12474.000	11675	12824.000
16	51.400	52.700	51.467	52.750	10910	10395	11013	10215	5990	5990	5955.000	5955	5972.500
17	43.800	50.100	46.967	51.250	10633	10842	9918	10196	12108	10261	12515.000	11182	12311.500
18	50.400	54.900	51.900	55.000	8858	9166	8532	8593	8837	8930	8509.000	8293	8673.000
19	43.200	50.600	46.733	51.600	9043	9655	10092	10734	16157	9647	15872.000	10199	16014.500
20	•	49.900	50.900	50.400	•	13887	•	13266	•	7064	•	7770	•

	Thi_sc2	Thi_ar1	Thi_ar2	TEE_1	TEE_2	EEPA_1	EEPA_2	NVAEE_1	NVAEE_2	PAL_1	PAL_2	Lep_1	Lep_2
Type:	Real	Real	Real	Integer	Integer	Real	Real	Real	Real	Real	Real	Real	Real
Source:	User Enter...	User Enter...	User Enter...	User Ent...	User Ent...	User Entered	User Entered	User Entered	User Entered	User Ent...	User Ent...	User Ent...	User Ent...
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuo...	Continuo...
Format:	Free Form...	Free Form...	Free Form...	•	•	Free Form...	Free Form...	Free Format ...	Free Format ...	Free For...	Free For...	Free For...	Free For...
Dec. Places:	3	3	3	•	•	3	3	3	3	3	3	3	3
Mean:	9365.184	10589.375	11016.447	2611.214	2599.385	958.307	975.600	539.601	479.125	1.855	1.904	8.976	7.953
Std. Deviation:	2174.356	1364.247	1499.669	521.139	440.362	415.489	405.476	567.817	453.884	.301	.371	4.280	4.365
Std. Error:	498.831	341.062	344.048	139.280	122.134	111.044	112.459	163.915	131.025	.081	.107	1.038	1.127
Variance:	4727822.478	1861169.1...	2249006.8...	271586.3...	193918.4...	172630.701	164410.782	322416.597	206010.553	.091	.137	18.316	19.050
Coeff. of Variation:	.232	.129	.136	.200	.169	.434	.416	1.052	.947	.163	.195	.477	.549
Minimum:	5674.000	8695.000	8864.500	1951	1851	485.800	345.900	-328.100	-340.000	1.510	1.402	3.600	1.700
Maximum:	14499.000	13238.000	13576.500	3799	3486	1909.100	1817.400	1532.100	1450.400	2.516	2.640	16.900	18.800
Range:	8825.000	4543.000	4712.000	1848.000	1635.000	1423.300	1471.500	1860.200	1790.400	1.006	1.238	13.300	17.100
Count:	19	16	19	14	13	14	13	12	12	14	12	17	15
Missing Cells:	1	4	1	6	7	6	7	8	8	6	8	3	5
Sum:	177938.500	169430.000	209312.500	36557.000	33792.000	13416.300	12682.800	6475.210	5749.500	25.970	22.847	152.600	119.300
Sum of Squares:	1.752E9	1822075344	2.346E9	98988783	90165426	15101135....	14346269....	7040611.278	5020845.270	49.356	45.010	1662.860	1215.530

	Thi_sc2	Thi_ar1	Thi_ar2	TEE_1	TEE_2	EEPA_1	EEPA_2	NVAEE_1	NVAEE_2	PAL_1	PAL_2	Lep_1	Lep_2
1	•	•	•	•	•	•	•	•	•	•	•	•	•
2	8829.500	8750.000	8864.500	•	•	•	•	•	•	•	•	3.700	4.600
3	14499.000	11010.000	11099.000	2451	2354	805.900	748.600	590.900	240.600	1.750	1.720	16.300	11.400
4	8190.500	•	13575.000	2492	2852	662.800	996.800	•	715.800	1.580	1.820	3.600	5.200
5	12374.500	11319.000	11994.000	2691	2943	971.900	1198.700	-328.100	820.400	1.856	2.030	10.600	9.600
6	9053.500	10330.000	10381.000	2062	2182	485.800	613.800	•	363.200	1.510	1.620	5.200	5.300
7	9406.000	11237.500	11241.500	1951	2339	525.900	655.100	435.900	512.500	1.586	1.610	5.500	•
8	10504.000	9898.500	10541.500	2376	2557	738.400	1141.300	738.400	925.300	1.700	2.200	8.000	6.400
9	7896.500	•	10111.500	2191	2869	631.900	1232.100	153.900	•	1.635	2.125	•	•
10	5674.000	12736.000	13030.500	2602	3143	976.800	1508.700	976.800	•	1.906	2.380	•	1.700
11	10373.500	10715.500	10411.500	•	•	•	•	-236.090	•	•	•	8.400	8.000
12	8088.000	12177.500	12640.500	2632	2480	1058.800	752.000	777.800	386.000	1.780	1.680	6.700	9.400
13	8234.000	8878.000	9286.500	2070	2420	633.000	1018.000	-91.000	291.000	1.683	•	14.200	6.800
14	9865.000	9640.500	9908.500	•	•	•	•	•	•	•	•	13.200	9.300
15	12305.000	13238.000	12752.500	•	•	•	•	•	•	•	•	16.900	18.800
16	5972.500	10961.500	10305.000	3386	3486	1607.400	1817.400	•	1450.400	2.350	2.640	4.600	4.300
17	10721.500	10275.500	10519.000	3001	•	1150.900	•	927.900	-340.000	1.940	•	10.300	•
18	8611.500	8695.000	8879.500	•	•	•	•	•	•	•	•	9.200	14.000
19	9923.000	9567.500	10194.500	2853	1851	1257.700	345.900	996.700	191.900	2.178	1.402	11.000	•
20	7417.000	•	13576.500	3799	2316	1909.100	654.400	1532.100	192.400	2.516	1.620	5.200	4.500

	En_int	Prot_g	CHO_g	Fat_g	Sat_g	Mono_g	Poly_g	Chol_mg	Fiber	Per_Pro	per_CHO	per_Fat	Fat_Sat	Fat_Mon
Type:	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real
Source:	User Ent...	User Ent...	User Ente...	User En...	User En...	User Enter...	User Ent...	User Entered	User En...	User Entered	User Entered	User Enter...	User Enter...	User Entered
Class:	Continuo...	Continuous	Continuous	Continu...	Continu...	Continuous	Continuous	Continuous	Continu...	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	Free For...	Free For...	Free Form...	Free Fo...	Free For...	Free Form...	Free For...	Free Format...	Free Fo...	Free Form...	Free Format...	Free Form...	Free Form...	Free Forma...
Dec. Places:	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Mean:	1969.333	68.003	279.780	63.182	22.127	23.595	12.781	164.306	18.511	.142	.566	.286	.347	.370
Std. Deviation:	435.125	11.410	71.966	21.047	8.080	8.128	4.560	48.074	6.296	.028	.067	.064	.034	.018
Std. Error:	102.560	2.689	16.962	4.961	1.905	1.916	1.075	11.331	1.484	.007	.016	.015	.008	.004
Variance:	189333.7...	130.178	5179.062	442.965	65.289	66.067	20.796	2311.108	39.640	.001	.004	.004	.001	3.139E-4
Coeff. of Variation:	.221	.168	.257	.333	.365	.344	.357	.293	.340	.195	.118	.223	.096	.048
Minimum:	1197.000	46.000	147.000	29.295	10.313	10.798	5.472	69.000	8.778	.108	.465	.160	.299	.340
Maximum:	2677.887	90.388	407.625	103.258	38.650	38.753	21.327	250.545	29.740	.206	.720	.408	.425	.400
Range:	1480.887	44.388	260.625	73.963	28.337	27.955	15.855	181.545	20.962	.098	.255	.248	.126	.060
Count:	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Missing Cells:	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Sum:	35447.999	1224.055	5036.037	1137.272	398.286	424.714	230.059	2957.507	333.199	2.550	10.194	5.156	6.254	6.668
Sum of Squares:	7.303E7	85452.547	1497025.6...	79385.3...	9922.784	11144.368	3293.913	525224.714	6841.743	.374	5.850	1.546	2.192	2.475

	En_int	Prot_g	CHO_g	Fat_g	Sat_g	Mono_g	Poly_g	Chol_mg	Fiber	Per_Pro	per_CHO	per_Fat	Fat_Sat	Fat_Mon
1	•	•	•	•	•	•	•	•	•	•	•	•	•	•
2	1197.000	46.000	147.000	49.000	19.000	17.000	10.000	148.000	9.000	.150	.490	.370	.380	.340
3	2323.392	90.388	290.852	78.726	25.046	30.730	16.866	225.028	19.050	.156	.501	.305	.318	.390
4	2677.887	72.495	407.625	83.158	28.250	29.667	19.097	162.627	29.740	.108	.609	.279	.340	.357
5	2416.918	69.322	281.107	103.258	38.650	38.753	18.687	250.545	10.982	.115	.465	.385	.374	.375
6	2058.293	72.303	314.398	60.583	19.585	23.230	12.642	225.173	15.237	.141	.611	.265	.323	.383
7	2193.513	72.802	277.215	85.145	31.013	33.138	15.287	176.103	17.678	.133	.506	.349	.364	.389
8	2026.000	72.000	289.000	68.000	27.000	28.000	9.000	143.000	23.000	.140	.570	.300	.400	.400
9	2094.457	66.648	339.282	54.807	17.808	19.378	13.917	136.243	20.555	.127	.648	.236	.325	.354
10	1720.188	48.012	201.577	77.932	33.115	27.303	12.417	139.505	11.608	.112	.469	.408	.425	.350
11	1868.000	55.000	339.000	33.000	11.000	12.000	7.000	69.000	26.000	.120	.720	.160	.320	.360
12	1858.078	56.612	289.295	60.325	21.053	22.568	12.117	184.738	24.860	.122	.623	.292	.349	.374
13	1537.655	79.277	219.162	38.892	14.362	13.365	7.368	192.075	8.778	.206	.570	.228	.369	.344
14	1959.000	72.000	286.000	65.000	22.000	24.000	14.000	161.000	21.000	.150	.580	.300	.340	.370
15	1388.000	61.000	194.000	37.000	11.000	14.000	9.000	104.000	15.000	.170	.560	.240	.300	.370
16	2359.873	77.280	350.085	65.812	19.692	24.283	16.598	175.458	21.278	.131	.593	.251	.299	.369
17	1256.113	61.667	182.427	29.295	10.313	10.798	5.472	91.327	14.468	.196	.581	.210	.352	.369
18	•	•	•	•	•	•	•	•	•	•	•	•	•	•
19	1881.460	73.024	237.960	54.838	19.010	21.924	9.266	156.762	17.394	.155	.506	.262	.347	.400
20	2632.170	78.227	390.053	92.502	30.388	34.575	21.327	216.922	27.570	.119	.593	.316	.329	.374

	Fat_Pol	Input Column
1	.	
2	.210	
3	.214	
4	.230	
5	.181	
6	.209	
7	.180	
8	.130	
9	.254	
10	.159	
11	.220	
12	.201	
13	.189	
14	.210	
15	.210	
16	.252	
17	.187	
18	.	
19	.169	
20	.231	

	Fat_Pol	Input Column
Type:	Real	Real
Source:	User Enter...	User Entered
Class:	Continuous	Continuous
Format:	Free Form...	Free Format Fixed
Dec. Places:	3	3
Mean:	.202	•
Std. Deviation:	.032	•
Std. Error:	.007	•
Variance:	.001	•
Coeff. of Variation:	.156	•
Minimum:	.130	•
Maximum:	.254	•
Range:	.124	•
Count:	18	•
Missing Cells:	2	•
Sum:	3.635	•
Sum of Squares:	.751	•

	DOB	Ethnic	Age	group	orcon	Start	Situtation	Status	Pre Date	Post Date	MONW	Geno #	Geno	LMP_1	LMP-2
Type:	Date/Ti...	String	Integer	Integer	Integer	Date/T...	String	Integer	Date/Time	Date/Time	Integer	Integer	String	Date/Time	Date/Time
Source:	User E...	User Ent...	User ...	User En...	User En...	User E...	User Entered	User Ent...	User Entered	User Entered	User Ent...	User Ente...	User En...	User Ent...	User Ent...
Class:	Contin...	Nominal	Conti...	Continu...	Continu...	Contin...	Nominal	Continuo...	Continuous	Continuous	Continuous	Continuous	Nominal	Continuous	Continuo...
Format:	12/31/99	•	•	•	•	12/31/99	•	•	12/31/99	12/31/99	•	•	•	12/31/99	12/31/99
Dec. Places:	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Mean:	2.08E9	•	27.800	2.000	.700	2.98E9	•	2.000	2972648160	2990437920	1.750	700.667	•	2.99E9	3001730...
Std. Deviation:	1.088E8	•	3.488	0.000	.470	2.946E7	•	0.000	25481367.3...	25283876.335	.444	226.176	•	1.643E7	2.175E7
Std. Error:	2.432E7	•	.780	0.000	.105	6.587E6	•	0.000	5697806.944	5653646.622	.099	53.310	•	4953097....	6.278E6
Variance:	1.183E...	•	12.168	0.000	.221	8.677E...	•	0.000	6.493E14	6.393E14	.197	51155.412	•	2.699E14	4.729E14
Coeff. of Variation:	5.221E-2	•	.125	0.000	.672	9.895E-3	•	0.000	8.572E-3	8.455E-3	.254	.323	•	5.493E-3	7.245E-3
Minimum:	11/23/62		23	2	0	3/ 3/97		2	2/18/97	8/12/97	1	443		1/19/98	12/24/97
Maximum:	8/ 7/74		34	2	1	11/25/99		2	7/14/99	1/28/00	2	1033		7/ 5/99	1/26/00
Range:	3.69E8	•	11.000	0.000	1.000	86140...	•	0.000	75686400.0...	77673600.000	1.000	590.000	•	45964800	65923200
Count:	20	20	20	20	20	20	20	20	20	20	20	18	18	11	12
Missing Cells:	1	1	1	1	1	1	1	1	1	1	1	3	3	10	9
Sum:	4.17E10	•	556.000	40.000	14.000	5.95E10	•	40.000	59452963200	59808758400	35.000	12612.000	•	3.29E10	3.6E10
Sum of Squares:	8.701E...	•	15688	80.000	14.000	1.772E...	•	80.000	1.767E20	1.789E20	65.000	9706450....	•	9.838E19	1.081E20

Resistance Group N=20

	DOB	Ethnic	Age	group	orcon	Start	Situtation	Status	Pre Date	Post Date	MONW	Geno #	Geno	LMP_1	LMP-2
1	•		•	•	•	•		•	•	•	•	•		•	•
2	8/24/72	w	25	2	1	2/23/98	done-paid	2	2/13/98	9/18/98	2	631	11	2/11/98	•
3	8/ 7/74	w	24	2	1	6/18/99	done-paid	2	6/16/99	12/22/99	2	1031	11	6/ 2/99	12/15/99
4	1/27/70	w	27	2	1	5/ 9/97	done-paid	2	4/28/97	12/18/97	2	443	11	•	•
5	3/26/71	w	26	2	1	6/18/97	done-paid	2	5/21/97	1/14/98	2	452	11	•	12/31/97
6	11/23/62	w	34	2	1	6/30/97	done-paid	2	6/20/97	12/23/97	2	474	11	•	•
7	1/22/63	w	34	2	0	3/10/97	done-paid	2	2/28/97	9/16/97	2	•		•	•
8	9/15/71	w	27	2	1	12/19/97	done-paid	2	12/ 4/97	6/25/98	2	510	11	•	•
9	12/21/68	w	30	2	1	5/26/99	done-paid	2	5/25/99	12/ 8/99	1	458	11	5/ 8/99	9/10/99
10	3/20/65	w	34	2	0	7/14/99	done-paid	2	7/14/99	1/28/00	1	1033		7/ 5/99	1/26/00
11	4/19/73	w	24	2	1	4/20/98	done-paid	2	4/10/98	11/30/98	2	669	11	•	•
12	7/14/73	w	23	2	1	3/ 3/97	done-paid	2	2/18/97	8/12/97	2	•	11	•	•
13	10/29/68	w	29	2	0	2/16/98	done-paid	2	2/ 3/98	8/10/98	1	618	11	1/19/98	7/16/98
14	3/18/72	w	26	2	1	1/ 4/99	done-paid	2	12/11/98	7/12/99	2	964	11	12/ 8/98	6/26/99
15	11/27/71	w	26	2	1	6/16/97	done-paid	2	6/ 4/97	1/ 8/98	2	467	11	•	12/24/97
16	3/13/71	w	26	2	1	4/10/98	done-paid	2	4/ 1/98	10/21/98	1	658	12	3/17/98	10/ 6/98
17	6/29/70	w	28	2	1	8/ 3/98	done-paid	2	6/23/98	2/ 6/99	2	921	11	6/28/98	2/ 6/99
18	7/27/64	w	33	2	0	8/24/98	done-paid	2	8/13/98	2/ 9/99	2	870	11	8/11/98	1/29/99
19	3/ 4/72	w	25	2	1	3/29/97	done-paid	2	3/19/97	10/10/97	2	513	11	•	•
20	12/15/70	w	27	2	0	11/16/99	done-paid	2	11/16/98	6/21/99	2	951	11	11/ 1/98	5/22/99
21	8/24/70	w	28	2	0	11/25/99	done-paid	2	11/25/98	6/ 8/99	1	949	11	11/18/98	5/24/99

	fh_dm	height1	weight1	BMI1	height2	weight2	BMI2	sbp_1	sbp_2	dbp_1	dbp_2	BMD total (g/cm2)	BMD total 2
Type:	Integer	Real	Real	Real	Real	Real	Real	Integer	Real	Integer	Real	Real	Real
Source:	User Ent...	User Ente...	User Enter...	User E...	User Ente...	User Enter...	User E...	User Ent...	User Ent...	User Ent...	User Ent...	User Entered	User Entered
Class:	Continuo...	Continuous	Continuous	Contin...	Continuous	Continuous	Contin...	Continuo...	Continuo...	Continuo...	Continuo...	Continuous	Continuous
Format:	•	Free Form...	Free Form...	Free F...	Free Form...	Free Form...	Free F...	•	Free For...	•	Free For...	Free Format Fixed	Free Format Fi...
Dec. Places:	•	3	3	3	3	3	3	•	3	•	3	3	3
Mean:	.250	164.660	59.145	21.861	164.640	60.755	22.456	116.400	•	68.050	•	1.170	1.183
Std. Deviation:	.444	7.119	6.187	2.319	7.058	6.097	2.255	11.736	•	9.428	•	.056	.062
Std. Error:	.099	1.592	1.383	.519	1.578	1.363	.504	2.624	•	2.108	•	.012	.014
Variance:	.197	50.675	38.278	5.378	49.812	37.178	5.085	137.726	•	88.892	•	.003	.004
Coeff. of Variation:	1.777	.043	.105	.106	.043	.100	.100	.101	•	.139	•	.047	.052
Minimum:	0	151.000	47.200	16.066	151.000	52.400	17.837	99	•	51	•	1.042	1.021
Maximum:	1	180.000	70.200	25.525	180.000	73.000	26.622	137	•	84	•	1.284	1.299
Range:	1.000	29.000	23.000	9.459	29.000	20.600	8.785	38.000	•	33.000	•	.242	.278
Count:	20	20	20	20	20	20	20	20	0	20	0	20	20
Missing Cells:	1	1	1	1	1	1	1	1	21	1	21	1	1
Sum:	5.000	3293.200	1182.900	437.214	3292.800	1215.100	449.120	2328.000	0.000	1361.000	0.000	23.390	23.650
Sum of Squares:	5.000	543221.140	70689.910	9659.989	543073.020	74529.790	10182....	273596.0...	0.000	94305.000	0.000	27.413	28.040

	fh_dm	height1	weight1	BMI1	height2	weight2	BMI2	sbp_1	sbp_2	dbp_1	dbp_2	BMD total (g/cm2)	BMD total 2
1	•	•	•	•	•	•	•	•	•	•	•	•	•
2	0	174.800	68.200	22.320	174.000	73.000	24.112	130	•	80	•	1.193	1.209
3	1	173.000	60.000	20.047	173.000	60.800	20.315	107	•	56	•	1.097	1.114
4	0	166.200	55.900	20.237	166.200	55.800	20.201	129	•	75	•	1.216	1.263
5	0	163.600	59.300	22.156	164.000	60.000	22.308	112	•	75	•	1.140	1.166
6	0	151.000	58.200	25.525	151.000	60.700	26.622	114	•	56	•	1.284	1.299
7	0	173.200	58.100	19.368	172.800	60.900	20.395	100	•	60	•	1.180	1.231
8	0	171.400	47.200	16.066	171.400	52.400	17.837	128	•	74	•	1.154	1.172
9	1	160.700	61.800	23.931	160.700	63.300	24.512	99	•	51	•	1.201	1.200
10	1	164.000	68.000	25.283	164.400	69.400	25.678	131	•	65	•	1.100	1.127
11	0	163.200	66.700	25.043	163.200	67.100	25.193	103	•	64	•	1.158	1.155
12	0	156.600	53.000	21.612	156.000	56.700	23.299	129	•	83	•	1.130	1.141
13	0	166.800	59.500	21.386	166.800	62.400	22.428	129	•	79	•	1.157	1.165
14	0	165.300	55.000	20.129	164.600	55.500	20.485	115	•	64	•	1.210	1.219
15	0	158.600	58.800	23.376	158.600	59.400	23.615	113	•	67	•	1.224	1.226
16	1	154.800	50.300	20.991	154.800	52.800	22.034	116	•	70	•	1.042	1.021
17	1	161.000	54.400	20.987	161.000	54.000	20.833	109	•	58	•	1.193	1.190
18	0	180.000	70.200	21.667	180.000	70.400	21.728	108	•	70	•	1.192	1.218
19	0	163.000	53.200	20.023	163.000	53.500	20.136	103	•	65	•	1.121	1.114
20	0	164.200	64.800	24.034	165.000	66.800	24.536	137	•	84	•	1.163	1.180
21	0	161.800	60.300	23.034	162.300	60.200	22.854	116	•	65	•	1.235	1.240

	BMC tot (g)	BMC tot 2	BMC trunk	BMC trunk2	BMC arms	BMC arms2	BMC legs	BMC legs2	BMD spine	BMD spine2
Type:	Integer	Integer	Integer	Integer	Integer	Integer	Integer	Integer	Real	Real
Source:	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	•	•	•	•	•	•	•	•	Free Format F...	Free Format Fix...
Dec. Places:	•	•	•	•	•	•	•	•	3	3
Mean:	2510.800	2556.800	872.200	887.750	299.300	306.750	842.150	853.000	1.232	1.245
Std. Deviation:	263.237	262.063	111.177	101.375	42.199	39.118	101.511	109.481	.085	.106
Std. Error:	58.862	58.599	24.860	22.668	9.436	8.747	22.699	24.481	.019	.024
Variance:	69293.642	68676.800	12360.274	10276.829	1780.747	1530.197	10304.555	11986.105	.007	.011
Coeff. of Variation:	.105	.102	.127	.114	.141	.128	.121	.128	.069	.085
Minimum:	1997	1984	726	735	200	213	593	605	1.062	1.067
Maximum:	3103	3001	1168	1072	372	375	1020	1047	1.402	1.471
Range:	1106.000	1017.000	442.000	337.000	172.000	162.000	427.000	442.000	.340	.404
Count:	20	20	20	20	20	20	20	20	20	20
Missing Cells:	1	1	1	1	1	1	1	1	1	1
Sum:	50216.000	51136.000	17444.000	17755.000	5986.000	6135.000	16843.000	17060.000	24.635	24.903
Sum of Squares:	127398912.000	132049384....	15449502.000	15957261.000	1825444.000	1910985.000	14380119.000	14779916.000	30.481	31.223

	BMC tot (g)	BMC tot 2	BMC trunk	BMC trunk2	BMC arms	BMC arms2	BMC legs	BMC legs2	BMD spine	BMD spine2
1	•	•	•	•	•	•	•	•	•	•
2	2777	2892	989	1044	305	332	1014	1047	1.340	1.305.
3	2548	2579	948	916	269	312	864	878	1.200	1.126
4	2735	2739	952	975	350	326	929	932	1.313	1.305
5	2508	2551	774	853	345	302	824	820	1.143	1.260
6	2568	2614	926	946	297	311	875	890	1.212	1.333
7	2855	2969	942	938	359	375	950	1027	1.274	1.467
8	2324	2398	754	765	278	312	749	763	1.150	1.189
9	2344	2372	785	796	252	262	851	860	1.247	1.234
10	2310	2343	786	795	259	267	719	738	1.216	1.104
11	2504	2581	898	892	331	366	870	876	1.269	1.265
12	2116	2191	726	786	265	276	761	702	1.062	1.260
13	2341	2385	743	735	312	319	798	833	1.104	1.111
14	2400	2557	789	869	281	278	825	844	1.219	1.242
15	2558	2607	885	952	306	302	879	866	1.345	1.242
16	1997	1984	785	743	200	213	593	605	1.159	1.148
17	2512	2500	921	895	293	291	775	773	1.298	1.223
18	3103	3001	1168	1072	372	371	1020	1011	1.402	1.271
19	2269	2286	785	798	265	284	761	782	1.213	1.067
20	2667	2788	917	986	317	331	906	934	1.204	1.280
21	2780	2799	971	999	330	305	880	879	1.265	1.471

	BMD pelvis	BMD pelvis2	total ca++	total ca++2	Tis_Fa1	Tis_Fa2	Tis_Fa1.2	Tis_Fa2.2	Regn % fat	Regn % fat2	F_mass1
Type:	Real	Real	Integer	Integer	Real	Real	Real	Real	Real	Real	Real
Source:	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	Free Format F...	Free Format Fix...	•	•	Free Form...	Free Form...	Free Format ...	Free Format ...	Free Format F...	Free Format Fix...	Free Format ...
Dec. Places:	3	3	•	•	3	3	3	3	3	3	2
Mean:	1.149	1.155	954.150	970.150	30.055	29.665	30.055	29.665	28.825	28.465	17.13
Std. Deviation:	.082	.086	99.963	101.795	5.844	5.779	5.844	5.779	5.611	5.667	4.60
Std. Error:	.018	.019	22.352	22.762	1.307	1.292	1.307	1.292	1.255	1.267	1.03
Variance:	.007	.007	9992.661	10362.239	34.150	33.396	34.150	33.396	31.485	32.112	21.17
Coeff. of Variation:	.071	.075	.105	.105	.194	.195	.194	.195	.195	.199	.27
Minimum:	.985	1.001	759	754	20.400	19.600	20.400	19.600	20.400	18.700	9.43
Maximum:	1.343	1.354	1179	1140	43.900	42.700	43.900	42.700	42.400	41.200	28.53
Range:	.358	.353	420.000	386.000	23.500	23.100	23.500	23.100	22.000	22.500	19.09
Count:	20	20	20	20	20	20	20	20	20	20	20
Missing Cells:	1	1	1	1	1	1	1	1	1	1	1
Sum:	22.988	23.098	19083.000	19403.000	601.100	593.300	601.100	593.300	576.500	569.300	342.57
Sum of Squares:	26.550	26.817	18397905.000	19020703.000	18714.910	18234.770	18714.910	18234.770	17215.830	16815.250	6269.89

	BMD pelvis	BMD pelvis2	total ca++	total ca++2	Tis_Fa1	Tis_Fa2	Tis_Fa1.2	Tis_Fa2.2	Regn % fat	Regn % fat2	F_mass1
1	.	.	.	.	.	.	.	.	.	.	.
2	1.210	1.242	1055	1099	36.200	40.900	36.200	40.900	34.800	39.200	23.66
3	1.045	1.078	968	980	27.400	27.100	27.400	27.100	26.200	26.000	15.73
4	1.343	1.354	1039	1041	28.700	23.300	28.700	23.300	27.300	22.200	15.39
5	1.115	1.132	953	969	32.300	28.000	32.300	28.000	30.900	26.800	18.31
6	1.272	1.290	976	993	30.100	32.400	30.100	32.400	28.800	31.000	16.59
7	1.152	1.142	1085	1128	22.700	26.500	22.700	26.500	21.600	25.200	12.63
8	1.064	1.094	883	911	20.400	23.300	20.400	23.300	20.400	22.200	9.43
9	1.129	1.100	891	901	38.500	36.900	38.500	36.900	37.000	35.500	22.53
10	.985	1.001	878	891	43.900	42.700	43.900	42.700	42.400	41.200	28.53
11	1.126	1.075	952	981	31.300	30.700	31.300	30.700	30.100	29.500	19.80
12	1.152	1.169	804	804	29.200	31.800	29.200	31.800	28.000	31.800	14.47
13	1.109	1.114	890	906	31.500	29.700	31.500	29.700	30.200	28.500	17.88
14	1.162	1.117	912	972	26.500	27.000	26.500	27.000	25.300	25.800	13.65
15	1.267	1.295	972	991	27.900	27.600	27.900	27.600	26.700	26.300	15.86
16	1.084	1.074	759	754	36.300	34.800	36.300	34.800	34.800	33.500	17.73
17	1.202	1.191	955	950	30.500	26.800	30.500	26.800	29.100	25.500	15.61
18	1.140	1.174	1179	1140	32.300	28.800	32.300	28.800	30.800	27.500	21.76
19	1.117	1.146	862	869	21.400	19.600	21.400	19.600	20.400	18.700	10.56
20	1.148	1.134	1014	1060	30.700	30.600	30.700	30.600	29.400	29.300	19.14
21	1.166	1.176	1056	1063	23.300	24.800	23.300	24.800	22.300	23.600	13.32

	F_mass2	FF_m1	FF_m2	LTM trunk	LTM trunk.2	LTM arms	LTM arms2	LTM legs	LTM legs2	Appen_1	Appen_2	FM_tr
Type:	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real
Source:	User Entered	User Ente...	User Ente...	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User En...
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continu...
Format:	Free Format ...	Free For...	Free For...	Free Format ...	Free Format Fi...	Free Format ...	Free Format Fi...	Free Format...	Free Format ...	Free Forma...	Free Forma...	Free Fo...
Dec. Places:	2	2	2	2	2	2	2	2	2	2	2	2
Mean:	17.34	39.15	40.40	19.15	18.77	4.15	4.47	13.34	13.94	17.49	18.41	7.13
Std. Deviation:	4.88	3.73	3.20	1.65	3.61	.56	.50	1.54	1.65	1.99	2.04	2.24
Std. Error:	1.09	.83	.72	.37	.81	.12	.11	.34	.37	.44	.46	.50
Variance:	23.78	13.90	10.27	2.71	13.01	.31	.25	2.38	2.71	3.95	4.15	5.03
Coeff. of Variation:	.28	.10	.08	.09	.19	.13	.11	.12	.12	.11	.11	.31
Minimum:	9.86	31.18	33.09	16.04	4.58	3.16	3.53	10.28	10.93	13.44	14.46	3.49
Maximum:	28.81	45.70	47.63	22.81	22.33	5.06	5.43	15.94	18.22	21.00	23.18	12.45
Range:	18.96	14.52	14.54	6.77	17.75	1.90	1.90	5.66	7.29	7.56	8.73	8.96
Count:	20	20	20	20	20	20	20	20	20	20	20	20
Missing Cells:	1	1	1	1	1	1	1	1	1	1	1	1
Sum:	346.72	783.07	807.98	382.96	375.44	82.96	89.41	266.84	278.88	349.80	368.30	142.60
Sum of Squares:	6462.78	30924.03	32837.05	7384.37	7295.09	349.99	404.41	3605.41	3940.32	6193.16	6861.05	1112.32

	F_mass2	FF_m1	FF_m2	LTM trunk	LTM trunk.2	LTM arms	LTM arms2	LTM legs	LTM legs2	Appen_1	Appen_2	FM_tr
1	•	•	•	•	•	•	•	•	•	•	•	•
2	28.81	41.65	41.71	20.26	19.48	4.26	4.51	15.10	15.81	19.36	20.32	9.49
3	15.74	41.68	42.34	20.84	20.24	3.88	4.57	14.91	15.27	18.79	19.84	6.25
4	12.40	38.19	40.75	18.04	4.58	4.46	4.58	13.27	14.54	17.73	19.13	6.08
5	16.07	38.43	41.33	18.02	20.29	4.74	4.66	12.81	13.44	17.56	18.10	7.89
6	18.84	38.46	39.32	19.18	18.86	4.17	4.53	13.05	13.89	17.22	18.42	7.52
7	15.47	42.98	42.84	19.69	18.93	4.92	5.24	15.64	15.89	20.56	21.13	3.53
8	11.58	34.52	38.10	17.47	18.84	3.27	3.97	11.14	12.57	14.41	16.54	3.49
9	21.99	35.98	37.60	17.34	18.22	3.36	3.88	13.16	13.27	16.52	17.15	10.49
10	28.51	36.48	38.28	18.54	18.84	3.95	4.61	11.93	12.93	15.88	17.54	12.45
11	19.36	43.46	43.79	20.57	20.65	5.06	5.43	15.94	15.20	21.00	20.63	7.72
12	17.09	35.14	36.70	17.41	18.25	3.64	4.31	11.80	11.97	15.43	16.27	6.38
13	17.13	38.88	40.64	19.43	18.39	4.41	4.99	12.57	13.98	16.98	18.96	8.65
14	14.37	37.93	38.85	18.90	19.99	3.82	3.78	12.44	12.23	16.26	16.01	6.53
15	15.52	41.06	40.78	19.73	20.41	4.38	4.38	14.25	13.35	18.63	17.73	6.91
16	17.67	31.18	33.09	16.04	16.62	3.16	3.53	10.28	10.93	13.44	14.46	7.32
17	13.53	35.62	37.03	17.78	17.93	3.73	4.04	12.09	12.76	15.82	16.81	5.53
18	19.24	45.70	47.63	22.81	22.33	4.64	4.96	13.31	18.22	17.95	23.18	8.54
19	9.86	38.80	40.44	18.86	20.16	3.83	4.11	13.49	13.53	17.32	17.64	3.95
20	19.53	43.20	44.23	20.49	21.73	4.73	4.96	15.21	14.75	19.94	19.71	8.21
21	14.03	43.73	42.51	21.56	20.71	4.55	4.37	14.46	14.34	19.01	18.72	5.66

	FM_tr2	FM_arms	FM arms2	FM legs	FM legs2	FM_per1	FM_per2	VO2_l1	VO2_l2	V02_kg1	VO2_kg2	max hr
Type:	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Integer
Source:	User Ent...	User Entered	User Entered	User Enter...	User Entered	User Entered	User Entered	User Ente...	User Ente...	User Entered	User Entered	User Ent...
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	Free For...	Free Format...	Free Format ...	Free Form...	Free Format...	Free Forma...	Free Forma...	Free For...	Free For...	Free Forma...	Free Format...	•
Dec. Places:	2	2	2	2	2	2	2	3	3	2	2	•
Mean:	7.25	1.48	1.55	7.20	7.11	8.68	8.66	2.042	2.145	35.78	35.59	191.950
Std. Deviation:	2.33	.49	.58	1.98	2.18	2.28	2.62	.412	.339	6.84	5.70	7.924
Std. Error:	.52	.11	.13	.44	.49	.51	.58	.092	.080	1.53	1.34	1.772
Variance:	5.44	.24	.34	3.94	4.73	5.21	6.84	.170	.115	46.81	32.47	62.787
Coeff. of Variation:	.32	.33	.37	.28	.31	.26	.30	.202	.158	.19	.16	.041
Minimum:	3.98	.46	.82	4.38	4.20	4.85	5.03	1.452	1.487	21.40	25.40	179
Maximum:	12.19	2.31	2.73	11.83	12.81	14.14	15.45	2.931	2.719	48.60	44.10	210
Range:	8.21	1.85	1.92	7.44	8.60	9.29	10.42	1.478	1.231	27.20	18.70	31.000
Count:	20	20	20	20	20	20	20	20	18	20	18	20
Missing Cells:	1	1	1	1	1	1	1	1	3	1	3	1
Sum:	145.10	29.67	31.00	143.94	142.22	173.61	173.22	40.831	38.602	715.59	640.61	3839.000
Sum of Squares:	1156.10	48.60	54.45	1110.67	1101.29	1605.94	1630.25	86.590	84.738	26493.05	23350.86	738089.0...

	FM_tr2	FM_arms	FM arms2	FM legs	FM legs2	FM_per1	FM_per2	VO2_l1	VO2_l2	V02_kg1	VO2_kg2	max hr
1	•	•	•	•	•	•	•	•	•	•	•	•
2	11.57	1.63	2.64	10.74	12.81	12.38	15.45	2.039	2.245	29.90	30.76	187
3	6.19	1.00	1.20	7.03	6.95	8.03	8.15	2.058	2.292	34.30	37.70	194
4	5.05	1.89	1.06	6.18	5.27	8.07	6.33	1.962	2.292	35.10	38.90	182
5	6.99	1.94	1.56	7.04	6.22	8.98	7.78	1.800	2.184	32.38	36.40	200
6	8.45	.99	1.32	6.85	7.82	7.85	9.15	1.800	2.379	41.24	39.20	201
7	4.49	1.26	1.42	6.27	6.34	7.53	7.76	1.800	•	35.70	•	195
8	4.26	.46	.82	4.38	5.24	4.85	6.06	1.800	1.871	35.24	35.70	201
9	10.70	1.94	1.81	8.73	8.20	10.67	10.01	1.452	1.652	23.50	26.10	190
10	12.19	2.31	2.73	11.83	11.70	14.14	14.43	1.455	1.763	21.40	25.40	179
11	7.82	1.76	2.31	8.99	7.98	10.75	10.29	2.294	•	34.40	•	191
12	6.70	1.14	1.62	6.62	7.35	7.77	8.97	2.231	2.149	42.10	37.90	210
13	7.79	2.06	2.14	6.09	6.09	8.14	8.23	1.892	2.051	31.80	32.87	197
14	7.22	1.37	1.18	4.97	4.85	6.34	6.03	1.782	1.487	32.40	26.80	180
15	7.30	1.90	1.78	5.94	5.41	7.84	7.19	1.800	2.299	37.24	38.70	192
16	7.68	1.44	1.39	7.42	7.16	8.86	8.55	1.630	1.660	32.40	31.44	190
17	4.57	1.09	.84	7.38	6.63	8.47	7.46	2.350	2.165	43.20	40.10	186
18	6.90	1.41	1.16	9.91	9.47	11.32	10.62	2.513	2.396	35.80	34.04	189
19	3.98	.85	.83	4.72	4.20	5.57	5.03	2.389	2.359	44.90	44.10	199
20	9.21	2.06	2.07	7.49	6.96	9.55	9.03	2.851	2.719	44.00	40.70	192
21	6.06	1.15	1.13	5.34	5.57	6.49	6.70	2.931	2.637	48.60	43.80	184

	max hr2	max RQ	max RQ2	LTA	LTA2	VO2_1	VO2_2	VCO2_1	VCO2_2	RMR_1	RMR_2	RQ	RQ2	M_abs1
Type:	Integer	Real	Real	Real	Real	Integer	Integer	Integer	Integer	Integer	Integer	Real	Real	Real
Source:	User Enter...	User Enter...	User Entered	User ...	User E...	User Ent...	User Ent...	User Entered	User Entered	User Ente...	User Ente...	User ...	User E...	User Enter...
Class:	Continuous	Continuous	Continuous	Conti...	Continu...	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Conti...	Contin...	Continuous
Format:	•	Free Form...	Free Format...	Free ...	Free Fo...	•	•	•	•	•	•	Free ...	Free F...	Free Form...
Dec. Places:	•	2	2	0	0	•	•	•	•	•	•	2	2	3
Mean:	190.176	1.15	1.15	300	317	200.900	210.450	170.200	181.050	1378.500	1451.100	.85	5.51	364.133
Std. Deviation:	8.553	.05	.05	193	290	16.546	20.549	14.951	17.437	114.307	139.763	.03	20.83	91.103
Std. Error:	2.074	.01	.01	50	70	3.700	4.595	3.343	3.899	25.560	31.252	.01	4.66	20.371
Variance:	73.154	2.22E-3	2.47E-3	37130	84125	273.779	422.261	223.537	304.050	13066.053	19533.674	1.15...	433.84	8299.753
Coeff. of Variation:	.045	.04	.04	1	1	.082	.098	.088	.096	.083	.096	.04	3.78	.250
Minimum:	176	1.08	1.08	42	91	170	157	151	133	1180	1070	.79	.80	219.340
Maximum:	210	1.25	1.24	645	1300	234	261	201	221	1600	1780	.92	94.00	522.700
Range:	34.000	.17	.16	603	1209	64.000	104.000	50.000	88.000	420.000	710.000	.13	93.20	303.360
Count:	17	20	17	15	17	20	20	20	20	20	20	20	20	20
Missing Cells:	4	1	4	6	4	1	1	1	1	1	1	1	1	1
Sum:	3233.000	22.94	19.51	4494	5385	4018.000	4209.000	3404.000	3621.000	27570.000	29022.000	16.95	110.17	7282.660
Sum of Squares:	616011.000	26.35	22.43	18660...	3051537	812418.0...	893807.0...	583608.000	661359.000	38253500	42484964	14.39	8849.78	2809552.139

	max hr2	max RQ	max RQ2	LTA	LTA2	VO2_1	VO2_2	VCO2_1	VCO2_2	RMR_1	RMR_2	RQ	RQ2	M_abs1
1	•	•	•	•	•	•	•	•	•	•	•	•	•	•
2	185	1.09	1.09	•	•	219	261	201	221	1530	1780	.92	.81	339.410
3	194	1.25	1.24	202	323	208	228	167	201	1410	1580	.80	.80	434.590
4	183	1.22	1.22	•	•	185	206	158	175	1270	1420	.86	.85	325.860
5	199	1.16	1.16	•	116	179	196	151	165	1220	1340	.85	.84	305.710
6	210	1.15	1.18	443	239	170	185	152	165	1180	1280	.89	.90	395.400
7	•	1.21	•	605	1300	223	228	185	189	1530	1560	.83	.83	522.700
8	196	1.16	1.09	•	•	177	208	152	184	1220	1440	.85	.89	310.000
9	176	1.15	1.23	126	198	197	200	178	188	1370	1430	.90	94.00	222.240
10	190	1.18	1.14	42	91	198	205	178	177	1380	1410	.90	.86	246.850
11	•	1.11	•	220	198	234	216	194	186	1600	1490	.83	.86	479.990
12	199	1.12	1.10	316	199	191	213	156	179	1300	1460	.82	.84	458.140
13	•	1.08	•	237	435	206	213	173	187	1410	1480	.84	.88	283.690
14	194	1.08	1.08	519	606	204	214	172	184	1400	1470	.84	.86	432.850
15	192	1.15	1.15	256	247	201	209	163	172	1360	1442	.81	.82	411.860
16	191	1.16	1.13	113	91	208	215	173	174	1420	1460	.83	.81	219.340
17	184	1.15	1.17	136	179	197	157	155	133	1340	1070	.79	.85	358.140
18	186	1.18	1.15	•	499	216	211	182	188	1480	1470	.85	.89	485.800
19	193	1.12	1.09	487	276	189	191	158	167	1290	1320	.84	.88	376.430
20	184	1.14	1.15	645	228	220	226	190	198	1520	1570	.86	.87	411.410
21	177	1.08	1.14	147	159	196	227	166	188	1340	1550	.84	.83	262.250

	M_corr1	M_abs2	M_corr2	M_FFM1	M_FFM2	Fasting Ins 1	Fasting Ins 2	Ins_1	Ins_2	Glu - 10' 1	Glu 0' 1	Glu 30' 1
Type:	Real	Real	Real	Real	Real	Real	Real	Real	Real	Integer	Integer	Real
Source:	User Enter...	User Enter...	User Enter...	User Entered	User Entered	User Entered	User Entered	User En...	User En...	User Entered	User Enter...	User Entered
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continu...	Continu...	Continuous	Continuous	Continuous
Format:	Free Form...	Free Form...	Free Form...	Free Form...	Free Form...	Free Format Fixed	Free Format Fixed	Free Fo...	Free Fo...	•	•	Free Forma...
Dec. Places:	3	2	3	2	2	2	2	2	2	•	•	2
Mean:	366.910	402.06	407.684	9.33	10.03	9.03	8.06	73.78	75.16	75.350	75.150	77.27
Std. Deviation:	95.224	87.84	90.444	2.10	1.83	2.06	1.61	13.81	12.97	4.534	4.416	4.26
Std. Error:	21.293	19.64	20.224	.47	.41	.57	.45	3.09	2.90	1.014	.987	.95
Variance:	9067.532	7715.81	8180.172	4.43	3.34	4.25	2.60	190.65	168.30	20.555	19.503	18.18
Coeff. of Variation:	.260	.22	.222	.23	.18	.23	.20	.19	.17	.060	.059	.06
Minimum:	205.363	219.43	225.984	5.71	6.83	6.25	6.25	50.87	49.97	65	64	70.50
Maximum:	532.223	525.41	541.330	13.27	13.22	12.10	11.95	103.00	103.00	85	84	84.33
Range:	326.860	305.98	315.346	7.57	6.39	5.85	5.70	52.13	53.03	20.000	20.000	13.83
Count:	20	20	20	20	20	13	13	20	20	20	20	20
Missing Cells:	1	1	1	1	1	8	8	1	1	1	1	1
Sum:	7338.197	8041.29	8153.688	186.56	200.62	117.40	104.80	1475.51	1503.19	1507.000	1503.000	1545.42
Sum of Squares:	2864739.966	3379719.93	3479554.718	1824.29	2075.86	1111.20	876.05	112479....	116176....	113943.000	113321.000	119761.50

	M_corr1	M_abs2	M_corr2	M_FFM1	M_FFM2	Fasting Ins 1	Fasting Ins 2	Ins_1	Ins_2	Glu - 10' 1	Glu 0' 1	Glu 30' 1
1	•	•	•	•	•	•	•	•	•	•	•	•
2	345.451	500.29	515.437	8.29	12.36	•	•	50.87	71.23	74	76	75.33
3	402.849	447.43	460.963	9.66	10.89	8.50	10.30	70.77	76.40	72	72	72.33
4	331.643	423.00	435.785	8.68	10.69	9.50	•	68.30	83.00	74	75	80.50
5	311.110	374.60	385.904	8.09	9.34	•	•	77.60	76.90	77	76	82.83
6	402.505	425.91	438.785	10.47	11.16	•	•	85.00	63.23	77	72	75.66
7	532.223	482.00	496.591	12.38	11.59	6.25	6.25	88.00	65.00	79	78	80.00
8	315.482	305.37	314.555	9.14	8.26	•	•	57.83	49.97	65	64	72.16
9	205.363	255.00	262.643	5.71	6.98	12.10	11.95	70.36	82.10	68	70	78.83
10	228.250	333.00	343.031	6.26	8.96	10.60	9.45	81.33	73.30	82	83	82.66
11	488.702	516.00	531.632	11.25	12.14	6.80	8.15	62.06	91.50	80	80	78.16
12	466.437	329.70	339.630	13.27	9.25	7.40	7.20	103.00	93.00	76	76	72.16
13	288.672	325.04	334.827	7.42	8.24	10.95	7.30	73.97	70.67	85	84	82.66
14	444.264	432.86	401.240	11.71	10.33	6.85	7.20	87.20	92.10	74	76	72.00
15	419.277	358.71	369.528	10.21	9.06	•	•	51.70	60.20	75	72	70.50
16	223.099	219.43	225.984	7.16	6.83	6.70	6.70	58.37	77.57	75	74	84.33
17	364.537	438.86	452.128	10.23	12.21	9.40	7.50	80.93	76.16	75	75	78.50
18	494.622	525.41	541.330	10.82	11.37	•	7.10	65.26	69.26	79	78	78.66
19	383.174	519.00	534.724	9.88	13.22	•	•	93.00	103.00	75	75	72.33
20	422.160	407.99	378.111	9.77	8.55	11.05	7.30	74.67	61.50	74	74	77.66
21	268.376	421.70	390.861	6.14	9.20	11.30	8.40	75.30	67.10	71	73	78.16

	Glu 60' 1	Glu 90' 1	Glu 120' 1	Ave Glu 1	Glu -10' 2	Glu 0' 2	Glu 30' 2	Glu 60' 2	Glu 90' 2	Glu 120' 2	Ave Glu 2	Chol_1
Type:	Real	Real	Real	Real	Integer	Integer	Real	Real	Real	Real	Real	Integer
Source:	User Entered	User Entered	User Entered	User Entered	User Entered	User Ente...	User Entered	User Entered	User Entered	User Entered	User Entered	User Ente...
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	Free Forma...	Free Forma...	Free Format ...	Free Format...	•	•	Free Forma...	Free Forma...	Free Forma...	Free Format ...	Free Format...	•
Dec. Places:	2	2	2	2	•	•	2	2	2	2	2	•
Mean:	79.40	79.57	76.78	77.68	76.105	75.900	81.37	79.35	77.30	75.77	78.45	182.850
Std. Deviation:	5.31	8.85	3.54	3.24	3.740	2.936	27.37	6.50	3.86	4.95	8.94	19.874
Std. Error:	1.19	1.98	.81	.74	.858	.657	6.12	1.45	.86	1.11	2.00	4.444
Variance:	28.19	78.40	12.56	10.50	13.988	8.621	749.19	42.26	14.90	24.47	79.93	394.976
Coeff. of Variation:	.07	.11	.05	.04	.049	.039	.34	.08	.05	.07	.11	.109
Minimum:	72.00	69.83	71.00	72.49	70	72	69.16	69.80	68.30	68.00	68.98	144
Maximum:	95.00	112.00	86.00	83.57	86	87	196.33	98.33	83.50	84.16	112.87	228
Range:	23.00	42.17	15.00	11.08	16.000	15.000	127.17	28.53	15.20	16.16	43.89	84.000
Count:	20	20	19	19	19	20	20	20	20	20	20	20
Missing Cells:	1	1	2	2	2	1	1	1	1	1	1	1
Sum:	1588.00	1591.41	1458.78	1475.90	1446.000	1518.000	1627.42	1587.07	1546.02	1515.44	1568.93	3657.000
Sum of Squares:	126622.85	128118.83	112228.13	114835.28	110300.000	115380.000	146659.34	126742.47	119792.02	115292.83	124595.72	676187.000

	Glu 60' 1	Glu 90' 1	Glu 120' 1	Ave Glu 1	Glu -10' 2	Glu 0' 2	Glu 30' 2	Glu 60' 2	Glu 90' 2	Glu 120' 2	Ave Glu 2	Chol_1
1	•	•	•	•	•	•	•	•	•	•	•	•
2	85.66	77.83	73.33	78.00	73	72	74.50	71.16	75.83	70.50	72.99	219
3	72.00	75.66	71.00	72.74	77	76	80.00	81.00	83.00	80.16	81.04	144
4	76.66	75.16	76.16	77.12	78	77	74.00	84.33	79.66	77.50	78.87	172
5	78.33	82.66	79.00	80.70	79	76	76.33	83.66	82.00	80.33	80.58	193
6	74.83	74.83	74.00	74.74	77	76	74.66	77.33	79.00	73.00	75.99	163
7	74.66	81.66	76.83	78.28	76	76	71.83	77.16	75.33	77.33	75.41	177
8	72.33	69.83	75.66	72.49	72	75	69.83	69.80	68.30	68.00	68.98	182
9	81.75	76.66	75.50	78.18	75	75	76.66	81.33	81.83	77.83	79.41	176
10	83.16	85.16	83.33	83.57	86	87	89.16	84.66	83.50	84.16	85.37	190
11	77.66	79.66	78.33	78.45	73	75	196.33	98.33	74.83	82.00	112.87	201
12	95.00	112.00	•	•	76	76	73.50	74.33	77.00	69.66	73.62	181
13	83.66	79.16	77.50	80.74	79	75	75.33	79.83	77.60	82.50	78.81	178
14	76.16	76.83	74.16	74.78	78	75	73.50	75.00	74.00	71.33	73.45	183
15	77.50	72.16	72.83	73.24	81	76	76.16	85.00	80.00	75.16	79.08	162
16	81.00	75.00	79.16	79.87	70	74	73.66	86.00	80.16	81.50	80.33	228
17	83.16	75.50	74.50	77.91	75	76	75.66	77.50	74.66	73.16	75.24	187
18	78.66	82.66	77.50	79.37	•	78	75.66	76.00	76.50	70.00	74.54	164
19	79.83	74.16	76.83	75.78	75	76	69.16	75.66	75.83	77.33	74.49	179
20	74.83	76.33	77.16	76.49	75	74	78.33	75.33	74.66	73.33	75.41	207
21	81.16	88.50	86.00	83.45	71	73	73.16	73.66	72.33	70.66	72.45	171

	Trig_1	HDL_1	LDL_1	Ch_HDL1	ins_0	ins_120	glu_0	glu_120	L2sc_1	L2sc_2	L2vis_1	L2vis_2	L4sc_1
Type:	Integer	Integer	Integer	Real	Real	Real	Real	Real	Integer	Integer	Integer	Integer	Integer
Source:	User Ent...	User Ente...	User Ent...	User Entered	User En...	User Entered	User En...	User Entered	User Ente...	User Ente...	User Enter...	User Enter...	User Ente...
Class:	Continuo...	Continuous	Continuous	Continuous	Continu...	Continuous	Continu...	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	•	•	•	Free Format ...	Free Fo...	Free Form...	Free Fo...	Free Form...	•	•	•	•	•
Dec. Places:	•	•	•	2	3	3	0	0	•	•	•	•	•
Mean:	100.850	56.450	106.200	3.40	8.550	61.515	79	96	10868.000	9516.316	4265.231	3332.684	18935.526
Std. Deviation:	38.072	14.051	19.851	.82	3.194	50.850	6	27	3830.082	4209.850	3516.592	1265.773	7874.961
Std. Error:	8.513	3.142	4.439	.18	.714	11.370	1	6	1023.633	965.806	975.327	290.388	1806.640
Variance:	1449.503	197.418	394.063	.67	10.201	2585.746	39	703	1.467E7	1.772E7	12366422....	1602180.7...	6.202E7
Coeff. of Variation:	.378	.249	.187	.24	.374	.827	8E-2	3E-1	.352	.442	.824	.380	.416
Minimum:	61	37	77	2.00	5.000	11.300	64	51	4524	3266	1486	1702	6684
Maximum:	189	94	146	4.80	16.900	254.600	90	145	18300	18061	13112	6647	30197
Range:	128.000	57.000	69.000	2.80	11.900	243.300	26	94	13776.000	14795.000	11626.000	4945.000	23513.000
Count:	20	20	20	20	20	20	19	19	14	19	13	19	19
Missing Cells:	1	1	1	1	1	1	2	2	7	2	8	2	2
Sum:	2017.000	1129.000	2124.000	68.10	171.000	1230.300	1510	1823	152152.000	180810.000	55448.000	63321.000	359775.000
Sum of Squares:	230955.0...	67483.000	233056.0...	244.65	1655.860	124811.070	120672	187462	1844291828	2039656166	384895586	239868151	7928799185

	Trig_1	HDL_1	LDL_1	Ch_HDL1	ins_0	ins_120	glu_0	glu_120	L2sc_1	L2sc_2	L2vis_1	L2vis_2	L4sc_1
1	•	•	•	•	•	•	•	•	•	•	•	•	•
2	73	69	135	3.20	10.200	40.800	77	72	13233	18061	1944	2297	30197
3	85	49	78	2.90	8.100	45.700	79	139	5345	5367	2094	2212	7053
4	134	48	97	3.58	8.500	46.700	72	69	•	5279	•	2175	12936
5	174	41	117	4.71	7.000	25.600	•	•	•	9760	•	4051	18499
6	68	52	97	3.13	5.000	43.100	76	101	11943	13876	•	4509	22231
7	68	39	124	4.50	6.000	53.000	82	79	•	6884	•	3232	10042
8	87	62	103	2.94	5.500	55.500	75	134	4524	6471	1486	3101	7575
9	107	60	95	2.93	16.900	68.300	74	100	14844	13423	13112	6647	28041
10	84	66	107	2.90	15.100	254.600	87	145	18300	•	10183	•	27102
11	144	56	116	3.59	8.800	84.500	85	125	•	15791	•	2491	27896
12	189	38	105	4.80	10.000	49.000	85	88	•	7884	•	3438	•
13	121	69	85	2.58	10.800	62.300	85	85	11869	11992	5291	5265	22683
14	138	57	98	3.21	8.300	48.200	81	78	12333	3266	2782	2368	17972
15	71	71	77	2.28	5.000	13.000	64	87	13222	13678	3651	4219	27723
16	117	69	136	3.30	8.700	64.800	86	98	10060	9829	2133	2981	20270
17	66	94	80	2.00	9.900	45.400	80	67	6347	5186	3467	3063	10868
18	61	51	101	3.20	5.000	32.100	79	78	8819	7616	2413	2340	24254
19	77	37	127	4.80	5.000	11.300	90	51	•	5465	•	2602	6684
20	65	48	146	4.31	8.100	105.100	78	120	12668	13227	4806	4628	22460
21	88	53	100	3.23	9.100	81.300	75	107	8645	7755	2086	1702	15289

	L4sc_2	L4vis_1	L4vis_2	RTatt_1	RTatt_2	LTatt_1	LTatt_2	Avatt_1	Avatt_2	RTarea_1	RTarea_2	LTarea_1	LTarea_2
Type:	Long Inte...	Integer	Integer	Real	Real	Real	Real	Real	Real	Integer	Integer	Integer	Integer
Source:	User Ente...	User Enter...	User Enter...	User Enter...	User Enter...	User Ente...	User Ente...	User Ente...	User Ente...	User Entered	User Entered	User Entered	User Entered
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	•	•	•	Free Form...	Free Form...	Free Form...	Free Form...	Free For...	Free For...	•	•	•	•
Dec. Places:	•	•	•	2	2	2	2	2	2	•	•	•	•
Mean:	17992.167	3995.056	3583.167	49.67	52.35	49.53	52.05	50.42	52.20	10801.294	11741.176	10683.235	11346.529
Std. Deviation:	8665.616	2202.572	1239.997	1.67	3.15	1.75	3.17	1.55	3.13	1970.741	1611.112	1736.012	1447.477
Std. Error:	2042.505	519.151	292.270	.40	.76	.42	.77	.36	.76	477.975	390.752	421.045	351.065
Variance:	7.509E7	4851324.7...	1537593.6...	2.77	9.90	3.06	10.07	2.39	9.82	3883819.346	2595682.029	3013738.816	2095189.640
Coeff. of Variation:	.482	.551	.346	.03	.06	.04	.06	.03	.06	.182	.137	.162	.128
Minimum:	6486	887	1784	46.90	49.30	47.10	48.80	48.43	49.25	7139	8790	7232	8779
Maximum:	37348	10184	6318	53.00	60.90	52.40	60.60	53.38	60.75	15243	15076	13827	14083
Range:	30862.000	9297.000	4534.000	6.10	11.60	5.30	11.80	4.95	11.50	8104.000	6286.000	6595.000	5304.000
Count:	18	18	18	17	17	17	17	18	17	17	17	17	17
Missing Cells:	3	3	3	4	4	4	4	3	4	4	4	4	4
Sum:	323859.000	71911.000	64497.000	844.44	890.00	842.00	884.80	907.51	887.40	183622.000	199600.000	181615.000	192891.000
Sum of Squares:	7103504347	369760961	257242593	41990.18	46752.56	41752.70	46212.28	45795.07	46479.36	2045496338....	2385069736....	1988455599	2222166439

	L4sc_2	L4vis_1	L4vis_2	RTatt_1	RTatt_2	LTatt_1	LTatt_2	Avatt_1	Avatt_2	RTarea_1	RTarea_2	LTarea_1	LTarea_2
1	•	•	•	•	•	•	•	•	•	•	•	•	•
2	37348	2536	3351	48.30	49.70	47.70	48.80	48.57	49.25	10200	11583	9865	11678
3	7020	3432	2712	50.04	60.90	49.20	60.60	53.38	60.75	11674	12380	11308	11879
4	12935	2883	2834	50.50	52.80	51.40	52.90	51.57	52.85	11009	11553	10471	10991
5	16102	3979	4205	48.20	50.80	48.10	50.90	49.03	50.85	10464	11035	10192	10624
6	26000	3232	4426	46.90	52.50	47.60	51.10	49.00	51.80	15243	15076	13827	13616
7	12909	3248	4635	50.10	50.30	48.00	51.40	49.47	50.85	9785	10621	9295	10498
8	9040	2092	3024	47.20	51.00	47.10	50.20	48.43	50.60	7139	9352	7232	9481
9	•	•	•	48.90	59.10	48.80	58.60	52.27	58.85	10442	11346	10682	11613
10	•	10184	•	49.30	•	49.50	•	49.40	•	7997	•	9277	•
11	28430	4451	4048	•	53.40	•	53.30	•	53.35	•	12924	•	11567
12	17942	•	3091	•	52.90	•	52.10	•	52.50	•	12550	•	11167
13	23964	7993	6318	52.30	49.90	51.60	50.80	51.27	50.35	10646	10469	10808	10260
14	6486	2818	2677	48.50	50.70	47.50	50.00	48.90	50.35	10056	8790	10742	8779
15	25320	2931	2572	50.10	50.70	50.60	50.00	50.47	50.35	12698	13569	12749	14083
16	19871	4316	4373	53.00	53.00	52.40	52.90	52.80	52.95	8662	10078	7935	9411
17	9387	4013	2809	50.80	•	51.40	•	51.10	•	9990	•	10042	•
18	23851	4062	3989	49.20	•	49.40	•	49.30	•	12156	•	12482	•
19	9081	887	1784	•	51.30	•	49.30	51.30	50.30	•	12208	•	11826
20	24466	6281	5790	49.50	49.30	49.70	49.30	49.50	49.30	12770	13407	12124	12829
21	13707	2573	1859	51.60	51.70	52.00	52.60	51.77	52.15	12691	12659	12584	12589

	RTsc_1	RTsc_2	LTsc_1	LTsc_2	Thi_sc1	Thi_sc2	Thi_ar1	Thi_ar2	TEE_1	TEE_2	EEPA_1	EEPA_2	NVAEE_1
Type:	Integer	Integer	Integer	Integer	Real	Real	Real	Real	Integer	Integer	Real	Real	Real
Source:	User Enter...	User Enter...	User Ente...	User Ente...	User Enter...	User Enter...	User Enter...	User Enter...	User Ent...	User Ent...	User Entered	User Entered	User Entered
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	•	•	•	•	Free Form...	Free Form...	Free Form...	Free Form...	•	•	Free Form...	Free Form...	Free Format ...
Dec. Places:	•	•	•	•	2	2	2	2	•	•	2	2	2
Mean:	10667.941	10427.588	10644.882	10339.294	10656.41	10383.44	10742.26	11543.85	2472.941	2356.375	848.59	694.36	522.94
Std. Deviation:	2931.597	3608.047	2871.018	3605.486	2885.50	3602.07	1832.15	1504.08	422.357	284.922	411.32	247.67	387.71
Std. Error:	711.017	875.080	696.324	874.459	699.84	873.63	444.36	364.79	102.437	71.230	99.76	61.92	107.53
Variance:	8594262.4...	13018003....	8242743.2...	1.3E7	8326103.63	12974880.75	3356776.19	2262253.09	178385.1...	81180.383	169186.89	61338.82	150320.12
Coeff. of Variation:	.275	.346	.270	.349	.27	.35	.17	.13	.171	.121	.48	.36	.74
Minimum:	4704	5634	4598	5470	4651.00	5552.00	7185.50	8784.50	1763	1908	366.70	277.20	-34.40
Maximum:	16628	17591	16800	18194	16714.00	17892.50	14535.00	14346.00	3165	3124	1578.50	1261.60	1147.00
Range:	11924.000	11957.000	12202.000	12724.000	12063.00	12340.50	7349.50	5561.50	1402.000	1216.000	1211.80	984.40	1181.40
Count:	17	17	17	17	17	17	17	17	17	16	17	16	13
Missing Cells:	4	4	4	4	4	4	4	4	4	5	4	5	8
Sum:	181355.000	177269.000	180963.000	175768.000	181159.00	176518.50	182618.50	196245.50	42040.000	37702.000	14426.00	11109.80	6798.28
Sum of Squares:	2072192671	2056776187	2058213737	2025309512	2063722557	2.04E9	2.02E9	2.3E9	106816610	90057756	14948724.10	8634310.76	5358965.41

	RTsc_1	RTsc_2	LTsc_1	LTsc_2	Thi_sc1	Thi_sc2	Thi_ar1	Thi_ar2	TEE_1	TEE_2	EEPA_1	EEPA_2	NVAEE_1
1	•	•	•	•	•	•	•	•	•	•	•	•	•
2	12548	17591	11980	18194	12264.00	17892.50	10032.50	11630.50	2702	•	901.80	•	•
3	11614	12326	11284	11829	11449.00	12077.50	11491.00	12129.50	•	•	•	•	•
4	9448	5963	9273	5778	9360.50	5870.50	10740.00	11272.00	3165	2302	1578.50	651.80	•
5	10419	6340	10567	6562	10493.00	6451.00	10328.00	10829.50	2085	2131	656.50	577.90	•
6	12059	11735	12257	11531	12158.00	11633.00	14535.00	14346.00	3062	2576	1575.80	1038.40	1132.80
7	6626	8757	6687	9004	6656.50	8880.50	9540.00	10559.50	2334	2422	570.60	619.80	-34.40
8	4704	6714	4598	6674	4651.00	6694.00	7185.50	9416.50	1763	1908	366.70	277.20	•
9	10402	11296	10223	11078	10312.50	11187.00	10562.00	11479.50	•	•	•	•	•
10	7931	•	9195	•	8563.00	•	8637.00	•	•	•	•	•	•
11	•	16765	•	16282	•	16523.50	•	12245.50	2236	2513	412.40	771.70	192.40
12	•	12196	•	12431	•	12313.50	•	11858.50	2166	2122	649.40	449.80	333.40
13	7707	12098	7487	11269	7597.00	11683.50	10727.00	10364.50	2270	2366	633.00	649.40	396.00
14	10728	5634	10062	5470	10395.00	5552.00	10399.00	8784.50	2274	2308	646.60	607.20	127.48
15	11313	8610	12471	8775	11892.00	8692.50	12723.50	13826.00	3070	2496	1403.00	804.40	1147.00
16	9053	9539	9099	9947	9076.00	9743.00	8298.50	9744.50	1997	2020	377.30	358.00	264.30
17	13998	•	12654	•	13326.00	•	10016.00	•	2252	2263	686.80	966.70	550.80
18	16628	•	16800	•	16714.00	•	12319.00	•	2201	2423	500.90	710.70	500.90
19	•	6530	•	6238	•	6384.00	•	12017.00	2790	2148	1221.00	613.20	734.00
20	13065	12517	13330	12461	13197.50	12489.00	12447.00	13118.00	2846	2580	1041.40	752.00	396.40
21	13112	12658	12996	12245	13054.00	12451.50	12637.50	12624.00	2827	3124	1204.30	1261.60	1057.20

	NVAEE_2	PAL_1	PAL_2	Lep_1	Lep_2	En_int	Prot_g	CHO_g	Fat_g	Sat_g	Mono_g	Poly_g	Chol_mg	Fiber
Type:	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real
Source:	User Entered	User Ent...	User Ent...	User Ent...	User Ent...	User Ent...	User Ent...	User Ente...	User En...	User En...	User Enter...	User Ent...	User Entered	User En...
Class:	Continuous	Continuous	Continuous	Continuo...	Continuo...	Continuo...	Continuous	Continuous	Continu...	Continu...	Continuous	Continuous	Continuous	Continu...
Format:	Free Format ...	Free For...	Free For...	Free For...	Free For...	Free For...	Free For...	Free Form...	Free Fo...	Free For...	Free Form...	Free For...	Free Format...	Free Fo...
Dec. Places:	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mean:	386.31	1.81	1.66	11.52	12.03	1891.41	62.33	266.02	62.35	21.14	23.62	12.98	153.46	17.98
Std. Deviation:	421.94	.38	.22	8.34	7.31	374.05	15.42	54.37	18.33	6.81	7.43	4.30	82.84	6.33
Std. Error:	112.77	.09	.06	2.02	1.68	90.72	3.74	13.19	4.45	1.65	1.80	1.04	20.09	1.53
Variance:	178034.80	.14	.05	69.49	53.40	139910.83	237.87	2956.42	336.06	46.37	55.22	18.52	6862.09	40.03
Coeff. of Variation:	1.09	.21	.13	.72	.61	.20	.25	.20	.29	.32	.31	.33	.54	.35
Minimum:	-680.20	1.37	1.32	3.20	5.10	926.00	27.00	124.00	37.00	11.00	16.62	7.00	30.29	10.67
Maximum:	1102.60	2.59	2.12	35.70	35.10	2751.00	92.63	346.00	102.00	38.00	40.00	24.14	318.00	36.85
Range:	1782.80	1.22	.80	32.50	30.00	1825.00	65.63	222.00	65.00	27.00	23.38	17.14	287.71	26.18
Count:	14	17	16	17	19	17	17	17	17	17	17	17	17	17
Missing Cells:	7	4	5	4	2	4	4	4	4	4	4	4	4	4
Sum:	5408.40	30.78	26.58	195.80	228.60	32153.99	1059.59	4522.39	1059.93	359.44	401.51	220.67	2608.81	305.70
Sum of Squares:	4403794.52	58.01	44.88	3367.02	3711.68	6.31E7	69848.70	1250359.90	71462.77	8341.80	10366.56	3160.55	510139.14	6137.49

	NVAEE_2	PAL_1	PAL_2	Lep_1	Lep_2	En_int	Prot_g	CHO_g	Fat_g	Sat_g	Mono_g	Poly_g	Chol_mg	Fiber
1	•	•	•	•	•	•	•	•	•	•	•	•	•	•
2	•	1.77	•	12.20	22.30	2007.70	71.38	324.60	51.40	16.59	17.98	13.35	92.98	25.60
3	•	•	•	8.10	8.30	1918.00	73.00	290.00	43.00	12.00	17.00	10.00	55.00	19.00
4	•	2.49	1.62	6.00	•	2036.47	70.48	333.76	51.54	19.46	16.93	10.69	175.32	20.55
5	461.90	1.71	1.59	•	8.20	1631.07	56.39	236.65	48.48	17.52	16.62	9.30	135.76	14.50
6	799.20	2.59	2.01	•	15.30	2016.20	92.63	234.29	78.81	26.30	31.18	14.03	303.40	19.61
7	-680.20	1.53	1.55	4.00	6.90	1680.05	42.53	258.62	56.94	22.81	20.27	10.31	103.74	14.16
8	•	1.45	1.32	3.20	5.30	926.00	27.00	124.00	37.00	11.00	17.00	7.00	48.00	11.00
9	•	•	•	35.70	35.10	1836.00	82.00	214.00	72.00	24.00	27.00	16.00	318.00	16.00
10	•	•	•	19.70	13.90	•	•	•	•	•	•	•	•	•
11	573.50	1.40	1.69	11.10	16.50	1956.43	56.37	286.73	70.95	23.01	29.70	12.63	120.58	14.37
12	250.80	1.67	1.45	22.70	17.80	•	•	•	•	•	•	•	•	•
13	214.40	1.61	1.60	15.90	11.40	•	•	•	•	•	•	•	•	•
14	1.20	1.62	1.57	6.00	8.20	1713.07	51.79	244.46	51.54	21.50	17.17	9.24	177.23	18.73
15	557.40	2.26	1.73	•	8.20	2020.31	62.75	253.05	77.53	23.18	31.04	17.73	182.98	12.78
16	267.00	1.37	1.38	13.70	12.20	2259.13	68.51	283.54	98.53	32.45	36.08	24.14	131.33	10.67
17	787.70	1.68	2.12	5.90	5.10	1804.21	55.35	270.44	55.53	19.90	20.58	10.94	94.79	17.60
18	211.70	1.49	1.65	6.80	9.10	1891.99	57.71	308.02	53.39	14.20	22.53	12.70	30.29	36.85
19	337.20	2.16	1.63	4.70	5.10	2171.70	70.95	302.94	52.59	19.06	20.08	8.86	213.17	17.41
20	524.00	1.87	1.64	12.00	12.30	1534.67	49.73	211.29	58.70	18.46	20.36	15.76	203.25	13.86
21	1102.60	2.11	2.02	8.10	7.40	2751.00	71.00	346.00	102.00	38.00	40.00	18.00	223.00	23.00

	Per_Pro	per_CHO	per_Fat	Fat_Sat	Fat_Mon	Fat_Pol	Input Column
Type:	Real	Real	Real	Real	Real	Real	Real
Source:	User Entered	User Entered	User Enter...	User Enter...	User Entered	User Enter...	User Entered
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	Free Form...	Free Format...	Free Form...	Free Form...	Free Forma...	Free Form...	Free Format Fixed
Dec. Places:	2	2	2	2	2	2	3
Mean:	.13	.57	.30	.34	.37	.21	•
Std. Deviation:	.02	.07	.06	.04	.04	.03	•
Std. Error:	.01	.02	.01	.01	.01	.01	•
Variance:	5.08E-4	4.37E-3	3.17E-3	1.61E-3	1.30E-3	1.03E-3	•
Coeff. of Variation:	.17	.12	.19	.12	.10	.16	•
Minimum:	.10	.46	.22	.27	.33	.17	•
Maximum:	.18	.67	.39	.42	.46	.27	•
Range:	.08	.21	.17	.15	.13	.10	•
Count:	17	17	17	17	17	17	•
Missing Cells:	4	4	4	4	4	4	•
Sum:	2.21	9.66	5.07	5.84	6.37	3.49	•
Sum of Squares:	.30	5.56	1.56	2.03	2.41	.73	•

	Per_Pro	per_CHO	per_Fat	Fat_Sat	Fat_Mon	Fat_Pol	Input Column
1	•	•	•	•	•	•	
2	.14	.65	.23	.32	.35	.26	
3	.12	.67	.22	.38	.34	.19	
4	.14	.66	.23	.38	.33	.21	
5	.14	.58	.27	.36	.34	.19	
6	.18	.46	.35	.33	.40	.18	
7	.10	.62	.31	.40	.36	.18	
8	.12	.54	.36	.29	.46	.19	
9	.18	.47	.35	.33	.37	.22	
10	•	•	•	•	•	•	
11	.12	.59	.33	.32	.42	.18	
12	•	•	•	•	•	•	
13	•	•	•	•	•	•	
14	.12	.57	.27	.42	.33	.18	
15	.12	.50	.35	.30	.40	.23	
16	.12	.50	.39	.33	.37	.25	
17	.12	.60	.28	.36	.37	.20	
18	.12	.65	.25	.27	.42	.24	
19	.13	.56	.22	.36	.38	.17	
20	.13	.55	.34	.31	.35	.27	
21	.10	.50	.33	.37	.39	.17	

	DOB	Age	Ethnic	group	orcon	Start	Situtation	Status	Pre Date	Post Date	MONW	Geno #	Geno	LMP_1	LMP-2
Type:	Date/Ti...	Integer	String	Integer	Integer	Date/T...	String	Integer	Date/Time	Date/Time	Integer	Integer	String	Date/Time	Date/Time
Source:	User E...	User ...	User Ent...	User En...	User En...	User E...	User Entered	User Ent...	User Entered	User Entered	User Ent...	User Ente...	User En...	User Ent...	User Ent...
Class:	Contin...	Conti...	Nominal	Continu...	Continu...	Contin...	Nominal	Continuo...	Continuous	Continuous	Continuous	Continuous	Nominal	Continuous	Continuo...
Format:	12/31/99	•	•	•	•	12/31/99	•	•	12/31/99	12/31/99	•	•	•	12/31/99	12/31/99
Dec. Places:	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Mean:	2.05E9	28.150	•	3.000	.450	2.95E9	•	2.000	2953126080	2973028320	1.900	518.824	•	29809296...	2989425...
Std. Deviation:	1.42E8	4.368	•	0.000	.510	1.851E7	•	0.000	18165578.5...	18269925.185	.308	215.887	•	2.234E7	2.503E7
Std. Error:	3.175E7	.977	•	0.000	.114	4.14E6	•	0.000	4061946.839	4085279.466	.069	52.360	•	1.117E7	1.022E7
Variance:	2.016E...	19.082	•	0.000	.261	3.428E...	•	0.000	3.300E14	3.338E14	.095	46607.154	•	4.991E14	6.267E14
Coeff. of Variation:	6.929E-2	.155	•	0.000	1.134	6.270E-3	•	0.000	6.151E-3	6.145E-3	.162	.416	•	7.494E-3	8.374E-3
Minimum:	9/21/61	20		3	0	1/10/97		2	2/10/97	8/15/97	1	294		5/27/97	12/30/97
Maximum:	12/ 3/76	35		3	1	12/11/98		2	12/ 2/98	7/15/99	2	957		11/10/98	7/ 7/99
Range:	4.8E8	15.000	•	0.000	1.000	60480...	•	0.000	57024000.0...	60393600.000	1.000	663.000	•	45964800	47865600
Count:	20	20	20	20	20	20	20	20	20	20	20	17	17	4	6
Missing Cells:	1	1	1	1	1	1	1	1	1	1	1	4	4	17	15
Sum:	4.1E10	563.000	•	60.000	9.000	5.91E10	•	40.000	59062521600	59460566400	38.000	8820.000	•	1.19E10	1.79E10
Sum of Squares:	8.439E...	16211	•	180.000	9.000	1.744E...	•	80.000	1.744E20	1.768E20	74.000	5321738....	•	3.555E19	5.362E19

Control Group N=20

	DOB	Age	Ethnic	group	orcon	Start	Situtation	Status	Pre Date	Post Date	MONW	Geno #	Geno	LMP_1	LMP-2
1	•	•		•	•	•		•	•	•	•	•		•	•
2	5/25/63	33	w	3	0	5/19/97	done-paid	2	5/ 9/97	12/11/97	2	448	11	•	•
3	3/13/75	22	w	3	1	6/ 9/97	done-paid	2	5/29/97	12/19/97	2	464	11	•	•
4	11/25/65	31	w	3	0	3/20/97	done-paid	2	3/10/97	9/19/97	2	•		•	•
5	6/ 4/67	29	w	3	1	5/12/97	done-paid	2	5/ 2/97	4/ 9/98	2	447	11	•	•
6	10/13/70	26	w	3	0	2/27/97	done-paid	2	2/17/97	8/15/97	2	296	11	•	•
7	8/23/63	33	w	3	0	8/11/97	done-paid	2	8/ 1/97	3/ 5/98	2	458	12	•	•
8	12/ 3/76	20	a	3	0	3/31/97	done-paid	2	3/21/97	12/30/97	2	458	12	•	•
9	9/11/73	24	w	3	0	1/10/97	done-paid	2	8/26/97	3/ 6/98	2	486	11	•	•
10	9/21/61	35	w	3	0	6/16/97	done-paid	2	6/ 5/97	1/22/98	2	466	11	•	12/30/97
11	2/19/68	29	w	3	1	4/25/97	done-paid	2	4/15/97	11/25/97	2	•		•	•
12	8/30/70	28	w	3	1	11/20/98	done-paid	2	11/20/98	6/23/99	1	957	11	11/10/98	5/22/99
13	8/26/68	28	w	3	0	3/17/97	done-paid	2	3/ 6/97	11/11/97	2	294	11	•	•
14	5/ 1/75	22	w	3	1	8/ 1/97	done-paid	2	7/23/97	2/27/98	2	477	11	•	•
15	10/16/63	33	w	3	1	3/28/97	done-paid	2	3/18/97	1/ 6/98	2	308	12	•	•
16	11/13/67	29	w	3	1	6/23/97	done-paid	2	6/13/97	1/23/98	1	476	11	5/27/97	1/ 6/98
17	1/ 3/66	32	w	3	0	12/11/98	done-paid	2	12/ 2/98	6/24/99	2	952	11	11/ 7/98	6/17/99
18	3/19/64	33	w	3	0	6/16/97	done-paid	2	6/ 6/97	1/13/98	2	427	11	•	•
19	8/14/71	27	w	3	1	11/ 1/98	done-paid	2	10/19/98	7/15/99	2	945	11	9/24/98	7/ 7/99
20	6/30/73	23	w	3	0	6/30/97	done-paid	2	6/19/97	1/29/98	2	461	11	•	1/ 3/98
21	6/22/70	26	w	3	1	2/21/97	done-paid	2	2/10/97	9/ 4/97	2	•		•	•

	fh_dm	height1	weight1	BMI1	height2	weight2	BMI2	sbp_1	sbp_2	dbp_1	dbp_2	BMD total (g/cm2)	BMD total 2
Type:	Integer	Real	Real	Real	Real	Real	Real	Integer	Real	Integer	Real	Real	Real
Source:	User Ent...	User Ente...	User Enter...	User E...	User Ente...	User Enter...	User E...	User Ent...	User Ent...	User Ent...	User Ent...	User Entered	User Entered
Class:	Continuo...	Continuous	Continuous	Contin...	Continuous	Continuous	Contin...	Continuo...	Continuo...	Continuo...	Continuo...	Continuous	Continuous
Format:	•	Free Form...	Free Form...	Free F...	Free Form...	Free Form...	Free F...	•	Free For...	•	Free For...	Free Format Fixed	Free Format Fi...
Dec. Places:	•	3	3	3	3	3	3	•	3	•	3	3	3
Mean:	.250	165.130	60.420	22.111	165.260	61.203	22.343	117.900	•	71.950	•	1.184	1.183
Std. Deviation:	.444	7.119	7.352	1.737	6.917	8.391	2.098	11.040	•	8.733	•	.074	.086
Std. Error:	.099	1.592	1.644	.388	1.547	1.876	.469	2.469	•	1.953	•	.017	.019
Variance:	.197	50.680	54.046	3.018	47.840	70.413	4.402	121.884	•	76.261	•	.006	.007
Coeff. of Variation:	1.777	.043	.122	.079	.042	.137	.094	.094	•	.121	•	.063	.073
Minimum:	0	152.000	50.000	19.133	152.000	49.300	18.944	105	•	55	•	1.047	1.000
Maximum:	1	175.400	78.000	25.469	175.400	77.200	26.095	147	•	87	•	1.319	1.379
Range:	1.000	23.400	28.000	6.337	23.400	27.900	7.151	42.000	•	32.000	•	.272	.379
Count:	20	20	20	20	20	20	20	20	0	20	0	20	20
Missing Cells:	1	1	1	1	1	1	1	1	21	1	21	1	1
Sum:	5.000	3302.600	1208.400	442.225	3305.200	1224.050	446.858	2358.000	0.000	1439.000	0.000	23.674	23.657
Sum of Squares:	5.000	546321.260	74038.400	9835.476	547126.320	76252.762	10067....	280324.0...	0.000	104985.0...	0.000	28.128	28.124

	fh_dm	height1	weight1	BMI1	height2	weight2	BMI2	sbp_1	sbp_2	dbp_1	dbp_2	BMD total (g/cm2)	BMD total 2
1	•	•	•	•	•	•	•	•	•	•	•	•	•
2	0	162.000	52.500	20.005	161.600	52.900	20.257	105	•	73	•	1.160	1.179
3	0	163.000	55.000	20.701	163.000	55.300	20.814	115	•	72	•	1.135	1.110
4	0	152.000	50.000	21.641	152.000	49.500	21.425	123	•	87	•	1.074	1.229
5	1	168.000	54.000	19.133	168.000	56.800	20.125	105	•	74	•	1.047	1.086
6	0	165.000	54.100	19.871	164.400	51.200	18.944	133	•	86	•	1.226	1.238
7	0	154.600	50.400	21.087	158.200	49.300	19.699	108	•	77	•	1.155	1.134
8	1	156.300	58.300	23.864	156.400	59.200	24.202	116	•	65	•	1.146	1.172
9	0	162.400	56.700	21.499	161.600	53.400	20.448	114	•	77	•	1.156	1.139
10	0	174.500	63.600	20.887	175.000	66.000	21.551	115	•	65	•	1.257	1.267
11	1	168.000	59.800	21.188	168.000	59.250	20.993	126	•	71	•	1.319	1.379
12	0	165.400	60.400	22.078	166.000	61.500	22.318	131	•	69	•	1.170	1.156
13	0	175.000	78.000	25.469	175.000	74.400	24.294	120	•	78	•	1.207	1.218
14	1	172.400	70.100	23.585	172.400	73.000	24.561	122	•	78	•	1.179	1.188
15	0	172.600	69.400	23.296	172.000	77.200	26.095	105	•	55	•	1.260	1.286
16	0	159.400	61.500	24.205	159.400	64.000	25.189	109	•	57	•	1.052	1.070
17	0	167.800	69.900	24.825	168.000	71.000	25.156	110	•	69	•	1.208	1.164
18	1	166.800	62.200	22.360	166.800	61.300	22.033	147	•	85	•	1.283	1.286
19	0	175.400	64.400	20.933	175.400	66.000	21.453	128	•	66	•	1.192	1.205
20	0	154.400	56.000	23.491	154.400	56.500	23.700	109	•	64	•	1.172	1.151
21	0	167.600	62.100	22.108	167.600	66.300	23.603	117	•	71	•	1.276	1.000

	BMC tot (g)	BMC tot 2	BMC trunk	BMC trunk2	BMC arms	BMC arms2	BMC legs	BMC legs2	BMD spine	BMD spine2
Type:	Integer	Integer	Integer	Integer	Integer	Integer	Integer	Integer	Real	Real
Source:	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	•	•	•	•	•	•	•	•	Free Format F...	Free Format Fix...
Dec. Places:	•	•	•	•	•	•	•	•	3	3
Mean:	2641.700	2678.500	906.200	941.750	330.400	325.500	836.550	899.700	1.224	1.268
Std. Deviation:	352.489	360.757	164.369	149.601	47.479	55.710	125.949	135.651	.132	.154
Std. Error:	78.819	80.668	36.754	33.452	10.617	12.457	28.163	30.333	.029	.034
Variance:	124248.432	130145.737	27017.116	22380.408	2254.253	3103.632	15863.208	18401.274	.017	.024
Coeff. of Variation:	.133	.135	.181	.159	.144	.171	.151	.151	.108	.121
Minimum:	2027	2096	627	732	250	240	645	677	.941	1.059
Maximum:	3076	3157	1163	1137	406	438	1052	1070	1.522	1.572
Range:	1049.000	1061.000	536.000	405.000	156.000	198.000	407.000	393.000	.581	.513
Count:	20	20	20	20	20	20	20	20	20	20
Missing Cells:	1	1	1	1	1	1	1	1	1	1
Sum:	52834.000	53570.000	18124.000	18835.000	6608.000	6510.000	16731.000	17994.000	24.481	25.368
Sum of Squares:	141932298.000	145960014....	16937294.000	18163089.000	2226114.000	2177974.000	14297719.000	16538826.000	30.295	32.628

	BMC tot (g)	BMC tot 2	BMC trunk	BMC trunk2	BMC arms	BMC arms2	BMC legs	BMC legs2	BMD spine	BMD spine2
1	•	•	•	•	•	•	•	•	•	•
2	2497	2536	779	831	335	299	809	815	1.164	1.059
3	2441	2406	783	815	300	274	857	832	1.111	1.061
4	2233	2198	677	744	265	258	752	738	1.196	1.221
5	2131	2242	627	732	267	266	751	755	.941	1.091
6	2647	2667	860	853	352	339	761	908	1.219	1.138
7	2137	2177	706	799	264	240	729	711	1.116	1.254
8	2456	2575	859	935	288	298	761	828	1.186	1.184
9	2543	2536	842	902	324	298	885	869	1.160	1.273
10	3066	3091	1047	1092	384	381	1052	1037	1.407	1.204
11	3076	3157	1163	1137	386	438	761	1013	1.522	1.492
12	2502	2527	848	864	289	274	858	874	1.190	1.129
13	2861	2800	985	922	351	363	761	1033	1.117	1.180
14	2914	3015	1035	1133	364	353	1021	1042	1.235	1.438
15	3033	3155	1093	1134	350	341	761	1070	1.381	1.572
16	2027	2096	719	754	250	255	645	677	1.082	1.174
17	3054	3092	1119	1118	374	375	1015	1049	1.330	1.353
18	2954	2922	1030	1004	367	356	1045	1044	1.227	1.300
19	2982	3034	1082	1135	372	357	1018	1015	1.343	1.398
20	2368	2355	817	834	320	328	728	706	1.233	1.319
21	2912	2989	1053	1097	406	417	761	978	1.321	1.528

	BMD pelvis	BMD pelvis2	total ca++	total ca++2	Tis_Fa1	Tis_Fa2	Regn % fat	Regn % fat2	F_mass1	F_mass2	FF_m1
Type:	Real	Real	Integer	Integer	Real	Real	Real	Real	Real	Real	Real
Source:	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Ente...
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	Free Format F...	Free Format Fix...	•	•	Free Form...	Free Form...	Free Format F...	Free Format Fix...	Free Format ...	Free Format ...	Free For...
Dec. Places:	3	3	•	•	3	3	3	3	2	2	2
Mean:	1.165	1.172	1002.700	1017.750	28.545	28.760	27.310	27.555	16.86	17.07	41.07
Std. Deviation:	.103	.099	135.376	137.182	6.620	6.672	6.453	6.424	5.97	5.99	4.08
Std. Error:	.023	.022	30.271	30.675	1.480	1.492	1.443	1.436	1.34	1.34	.91
Variance:	.011	.010	18326.747	18818.829	43.829	44.517	41.641	41.268	35.69	35.89	16.64
Coeff. of Variation:	.089	.084	.135	.135	.232	.232	.236	.233	.35	.35	.10
Minimum:	.964	.986	770	796	17.800	18.000	16.900	17.100	10.41	9.20	34.48
Maximum:	1.340	1.381	1169	1200	44.300	41.400	42.700	39.800	33.49	29.25	48.11
Range:	.376	.395	399.000	404.000	26.500	23.400	25.800	22.700	23.08	20.04	13.63
Count:	20	20	20	20	20	20	20	20	20	20	20
Missing Cells:	1	1	1	1	1	1	1	1	1	1	1
Sum:	23.292	23.444	20054.000	20355.000	570.900	575.200	546.200	551.100	337.24	341.39	821.41
Sum of Squares:	27.328	27.667	20456354.000	21073859.000	17129.090	17388.580	15707.900	15969.650	6364.62	6509.39	34052.09

	BMD pelvis	BMD pelvis2	total ca++	total ca++2	Tis_Fa1	Tis_Fa2	Regn % fat	Regn % fat2	F_mass1	F_mass2	FF_m1
1	•	•	•	•	•	•	•	•	•	•	•
2	1.070	1.091	949	964	24.600	25.500	23.400	24.300	12.24	12.70	37.53
3	1.026	1.036	928	914	22.400	22.800	21.400	21.800	11.68	11.96	40.44
4	1.075	1.112	826	835	27.600	27.000	26.400	25.800	13.13	12.74	34.48
5	.964	.986	810	852	28.800	29.700	27.600	28.500	14.86	16.09	36.80
6	1.119	1.134	1006	1013	22.900	23.000	21.700	21.800	11.68	11.10	39.40
7	1.121	1.098	812	827	23.600	23.800	22.600	22.800	11.16	11.21	36.17
8	1.139	1.166	933	978	26.900	27.500	25.800	26.300	14.71	15.21	39.91
9	1.159	1.158	966	964	21.200	18.000	20.200	17.100	11.07	9.20	41.25
10	1.297	1.271	1165	1174	26.900	27.100	25.600	25.900	16.15	17.22	43.88
11	1.310	1.313	1169	1200	23.600	21.800	22.400	20.600	13.45	12.32	43.47
12	1.091	1.123	951	960	36.600	32.100	35.100	30.800	22.11	18.76	38.30
13	1.171	1.200	1087	1064	44.300	41.400	42.700	39.800	33.49	29.25	42.10
14	1.267	1.260	1107	1146	32.800	35.300	31.400	33.800	21.40	24.09	43.86
15	1.251	1.249	1153	1199	33.800	39.100	32.400	37.500	23.97	28.43	46.88
16	1.050	1.043	770	796	38.800	39.000	37.500	37.700	22.77	23.73	35.93
17	1.163	1.175	1160	1175	34.200	33.000	32.700	31.600	23.38	22.41	44.98
18	1.266	1.255	1123	1110	17.800	19.700	16.900	19.700	10.41	12.20	48.11
19	1.236	1.219	1133	1153	23.900	27.300	22.800	26.000	14.96	17.07	47.67
20	1.177	1.174	900	895	29.600	27.100	28.400	25.900	15.83	13.86	37.60
21	1.340	1.381	1106	1136	30.600	35.000	29.200	33.400	18.78	21.84	42.65

	FF_m2	LTM trunk	LTM trunk.2	LTM arms	LTM arms2	LTM legs	LTM legs2	Appen_1	Appen_2	FM_tr	FM_tr2	FM_arms
Type:	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real
Source:	User Ente...	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User Entered	User En...	User Ent...	User Entered
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continu...	Continuous	Continuous
Format:	Free For...	Free Format ...	Free Format Fi...	Free Format ...	Free Format Fi...	Free Format...	Free Format ...	Free Forma...	Free Forma...	Free Fo...	Free For...	Free Format...
Dec. Places:	2	2	2	2	2	2	2	2	2	2	2	2
Mean:	40.90	19.05	19.99	4.66	4.41	14.27	14.08	18.94	18.49	6.86	7.19	1.68
Std. Deviation:	3.80	2.34	1.65	.63	.67	1.63	1.72	2.20	2.29	2.73	2.79	.83
Std. Error:	.85	.52	.37	.14	.15	.36	.38	.49	.51	.61	.62	.18
Variance:	14.46	5.48	2.72	.40	.45	2.66	2.95	4.84	5.25	7.43	7.78	.68
Coeff. of Variation:	.09	.12	.08	.14	.15	.11	.12	.12	.12	.40	.39	.49
Minimum:	34.48	13.22	17.39	3.76	3.38	11.88	10.87	15.64	14.35	3.82	3.30	.77
Maximum:	46.77	22.42	22.77	5.69	5.41	18.13	16.85	23.68	22.04	13.73	13.59	4.04
Range:	12.29	9.20	5.38	1.93	2.03	6.25	5.98	8.04	7.69	9.91	10.28	3.27
Count:	20	20	20	20	20	20	20	20	20	20	20	20
Missing Cells:	1	1	1	1	1	1	1	1	1	1	1	1
Sum:	818.00	380.99	399.74	93.26	88.16	285.45	281.58	378.71	369.74	137.23	143.74	33.63
Sum of Squares:	33730.61	7361.97	8041.22	442.46	397.10	4124.73	4020.57	7263.13	6935.26	1082.85	1180.85	69.48

	FF_m2	LTM trunk	LTM trunk.2	LTM arms	LTM arms2	LTM legs	LTM legs2	Appen_1	Appen_2	FM_tr	FM_tr2	FM_arms
1	.	.	.	.	.	.	.	.	.	.	.	.
2	37.03	17.45	18.02	4.33	3.69	13.37	13.04	17.70	16.73	3.82	4.21	.96
3	40.55	18.74	20.31	4.40	3.96	14.47	13.66	18.88	17.63	4.62	4.93	.77
4	34.48	15.98	17.57	3.76	3.48	11.88	10.87	15.64	14.35	6.04	6.52	1.43
5	38.08	17.17	19.25	4.08	3.85	13.33	13.17	17.41	17.02	4.25	5.25	1.47
6	37.19	19.22	18.07	4.21	3.79	12.73	12.28	16.94	16.07	4.95	4.66	1.23
7	35.83	17.51	18.69	3.89	3.38	12.29	11.40	16.18	14.77	4.69	5.31	1.38
8	40.09	18.70	19.45	4.32	4.28	14.07	13.72	18.39	18.00	6.75	6.93	1.03
9	42.06	19.46	21.11	4.27	3.96	14.81	14.37	19.08	18.33	4.00	3.30	.90
10	46.26	20.44	22.77	5.02	5.06	15.65	15.88	20.66	20.94	6.43	6.79	1.49
11	44.25	22.41	21.66	4.38	5.24	13.26	14.41	17.64	19.65	6.71	5.35	.96
12	39.67	19.17	20.19	4.04	3.65	12.69	13.32	16.73	16.97	10.29	9.12	2.16
13	41.39	19.43	19.25	5.27	4.88	15.45	15.38	20.72	20.26	13.73	11.61	4.04
14	44.23	21.10	21.33	5.08	4.74	15.23	16.11	20.31	20.84	6.76	9.83	2.29
15	44.28	21.72	21.37	5.69	5.05	16.62	15.17	22.31	20.22	10.45	13.59	2.76
16	37.10	17.39	18.14	3.99	3.98	12.72	13.33	16.72	17.31	9.43	10.21	2.77
17	45.44	22.42	21.04	5.19	5.41	14.93	16.63	20.11	22.04	9.96	8.34	2.24
18	46.77	13.22	22.29	5.56	5.25	16.35	16.21	21.92	21.45	4.25	5.10	.89
19	45.54	21.93	21.68	5.55	4.96	18.13	16.85	23.68	21.82	4.72	6.01	1.45
20	37.20	17.26	17.39	4.74	4.60	13.21	12.79	17.95	17.39	6.72	6.00	1.51
21	40.58	20.28	20.17	5.49	4.94	14.28	12.99	19.76	17.94	8.66	10.68	1.91

	FM arms2	FM legs	FM legs2	FM_per1	FM_per2	VO2_l1	VO2_l2	V02_kg1	VO2_kg2	max hr	max hr2	max RQ
Type:	Real	Real	Real	Real	Real	Real	Real	Real	Real	Integer	Integer	Real
Source:	User Entered	User Enter...	User Entered	User Entered	User Entered	User Ente...	User Ente...	User Entered	User Entered	User Ent...	User Enter...	User Enter...
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	Free Format ...	Free Form...	Free Format...	Free Forma...	Free Forma...	Free For...	Free For...	Free Forma...	Free Format...	•	•	Free Form...
Dec. Places:	2	2	2	2	2	3	3	2	2	•	•	2
Mean:	1.56	6.92	7.00	8.61	8.57	2.236	2.346	40.07	38.44	190.800	185.789	1.14
Std. Deviation:	.73	2.39	2.53	3.17	3.20	.474	.390	6.03	5.83	10.092	11.583	.04
Std. Error:	.16	.53	.57	.71	.72	.106	.090	1.35	1.34	2.257	2.657	.01
Variance:	.54	5.69	6.42	10.03	10.24	.225	.152	36.36	33.96	101.853	134.175	1.84E-3
Coeff. of Variation:	.47	.34	.36	.37	.37	.212	.166	.15	.15	.053	.062	.04
Minimum:	.71	4.32	4.09	5.20	4.93	1.800	1.606	27.80	25.10	170	167	1.07
Maximum:	2.98	13.80	12.96	17.83	15.88	3.158	2.949	50.20	50.30	211	212	1.25
Range:	2.27	9.48	8.87	12.63	10.94	1.358	1.343	22.40	25.20	41.000	45.000	.18
Count:	20	20	20	20	20	20	19	20	19	20	19	20
Missing Cells:	1	1	1	1	1	1	2	1	2	1	2	1
Sum:	31.23	138.50	140.07	172.13	171.30	44.714	44.577	801.36	730.45	3816.000	3530.000	22.89
Sum of Squares:	59.01	1067.25	1103.05	1671.97	1661.83	104.245	107.331	32799.92	28693.47	730028.0...	658252.000	26.23

	FM arms2	FM legs	FM legs2	FM_per1	FM_per2	VO2_l1	VO2_l2	V02_kg1	VO2_kg2	max hr	max hr2	max RQ
1	•	•	•	•	•	•	•	•	•	•	•	•
2	.95	5.98	6.11	6.94	7.06	2.037	2.101	38.80	39.71	180	179	1.13
3	.71	5.24	5.23	6.01	5.93	1.800	2.151	36.55	38.90	211	212	1.13
4	1.11	4.66	4.14	6.09	5.25	1.800	2.020	42.80	40.80	200	206	1.13
5	1.06	7.70	8.08	9.17	9.14	1.800	1.988	35.93	35.00	208	188	1.09
6	1.04	4.48	4.34	5.71	5.38	2.537	•	46.90	•	190	•	1.17
7	1.00	4.32	4.09	5.70	5.09	1.800	1.883	36.11	38.20	191	177	1.12
8	1.04	5.75	5.97	6.78	7.01	1.800	2.522	47.60	42.60	196	193	1.16
9	.74	5.12	4.19	6.02	4.93	2.500	2.686	44.10	50.30	190	191	1.18
10	1.55	6.92	7.41	8.40	8.97	2.868	2.653	45.10	40.20	170	168	1.15
11	1.24	4.71	4.76	5.67	6.00	3.002	2.245	50.20	41.34	190	192	1.13
12	1.63	8.18	6.81	10.34	8.44	2.189	2.023	36.25	32.90	195	188	1.15
13	2.91	13.80	12.96	17.83	15.88	2.863	2.701	36.70	36.30	188	185	1.19
14	2.28	8.87	10.30	11.15	12.58	1.800	2.949	41.94	40.40	181	189	1.08
15	2.98	9.12	10.13	11.88	13.10	2.138	2.316	30.80	30.00	200	170	1.19
16	2.31	9.26	9.89	12.04	12.20	1.800	1.606	27.80	25.10	187	167	1.12
17	2.64	9.47	9.71	11.71	12.35	2.768	2.925	39.60	41.20	173	178	1.19
18	1.00	4.32	5.03	5.20	6.03	1.800	2.385	43.05	38.90	189	192	1.25
19	1.44	7.13	7.85	8.58	9.30	3.158	2.937	49.04	44.50	196	187	1.14
20	1.27	6.43	5.53	7.94	6.80	2.066	2.463	36.90	43.60	190	180	1.07
21	2.33	7.05	7.55	8.96	9.87	2.186	2.022	35.20	30.50	191	188	1.12

	max RQ2	LTA	LTA2	VO2_1	VO2_2	VCO2_1	VCO2_2	RMR_1	RMR_2	RQ	RQ2	M_abs1	M_corr1	M_abs2
Type:	Real	Real	Real	Integer	Integer	Integer	Integer	Integer	Integer	Real	Real	Real	Real	Real
Source:	User Entered	User ...	User E...	User Ent...	User Ent...	User Entered	User Entered	User Ente...	User Ente...	User ...	User E...	User Enter...	User Enter...	User Enter...
Class:	Continuous	Conti...	Continu...	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Conti...	Contin...	Continuous	Continuous	Continuous
Format:	Free Format...	Free ...	Free Fo...	•	•	•	•	•	•	Free ...	Free F...	Free Form...	Free Form...	Free Form...
Dec. Places:	2	0	0	•	•	•	•	•	•	2	2	3	3	2
Mean:	1.12	472	397	201.300	202.750	168.850	171.100	1378.300	1392.500	.84	.85	460.917	469.965	488.24
Std. Deviation:	.06	196	379	21.014	24.242	15.142	14.356	139.680	157.843	.04	.04	136.089	139.529	176.60
Std. Error:	.01	49	98	4.699	5.421	3.386	3.210	31.233	35.295	.01	.01	30.430	31.200	40.52
Variance:	3.13E-3	38378	143511	441.589	587.671	229.292	206.095	19510.432	24914.474	1.85...	1.80E-3	18520.200	19468.226	31187.96
Coeff. of Variation:	.05	4E-1	1	.104	.120	.090	.084	.101	.113	.05	.05	.295	.297	.36
Minimum:	1.02	50	54	150	147	132	134	1030	1020	.77	.78	256.110	260.568	231.42
Maximum:	1.22	736	1335	233	249	192	195	1596	1680	.91	.93	727.290	747.533	894.84
Range:	.20	686	1281	83.000	102.000	60.000	61.000	566.000	660.000	.14	.15	471.180	486.965	663.42
Count:	19	16	15	20	20	20	20	20	20	20	20	20	20	19
Missing Cells:	2	5	6	1	1	1	1	1	1	1	1	1	1	2
Sum:	21.25	7559	5961	4026.000	4055.000	3377.000	3422.000	27566.000	27850.000	16.81	16.99	9218.340	9399.299	9276.52
Sum of Squares:	23.82	41464...	4377972	818824.0...	833317.0...	574563.000	589420.000	38364916	39254500	14.16	14.47	4600773.422	4787237.030	5090529.99

	max RQ2	LTA	LTA2	VO2_1	VO2_2	VCO2_1	VCO2_2	RMR_1	RMR_2	RQ	RQ2	M_abs1	M_corr1	M_abs2
1	•	•	•	•	•	•	•	•	•	•	•	•	•	•
2	1.08	•	•	183	147	166	134	1270	1020	.91	.92	365.400	371.935	442.95
3	1.10	269	304	194	188	160	158	1320	1290	.82	.84	344.310	350.444	385.53
4	1.10	388	•	176	171	147	159	1200	1190	.83	.93	503.300	512.455	504.00
5	1.22	•	190	184	222	150	177	1250	1510	.82	.79	592.400	603.248	583.54
6	•	•	•	217	211	166	176	1460	1440	.77	.84	353.300	359.605	•
7	1.22	•	•	150	174	132	160	1030	1210	.88	.92	336.140	342.119	316.27
8	1.13	370	115	187	193	165	163	1290	1320	.88	.84	458.900	467.211	452.54
9	1.16	704	234	202	210	166	176	1380	1440	.82	.84	530.900	540.579	456.84
10	1.09	486	383	217	227	188	182	1500	1540	.86	.80	445.570	453.628	574.26
11	1.06	736	703	216	226	181	184	1480	1540	.84	.82	519.710	529.176	536.58
12	1.12	50	54	198	180	177	159	1370	1250	.89	.88	263.140	269.293	231.42
13	1.12	678	94	195	210	176	184	1360	1450	.91	.88	572.860	583.336	516.00
14	1.11	480	125	227	234	183	191	1540	1600	.80	.82	367.430	374.003	894.84
15	1.15	561	1335	233	249	192	195	1596	1680	.82	.78	727.290	740.701	577.69
16	1.02	342	83	189	206	167	169	1310	1400	.89	.83	256.110	260.568	239.98
17	1.11	530	996	225	205	178	170	1530	1470	.79	.83	522.840	532.366	742.28
18	1.22	658	•	206	193	176	167	1420	1330	.85	.87	727.000	747.533	719.99
19	1.11	171	176	231	220	188	188	1570	1510	.81	.86	573.040	588.800	509.14
20	1.08	550	490	189	189	160	166	1300	1300	.85	.88	363.000	369.489	340.27
21	1.05	586	679	207	200	159	164	1390	1360	.77	.82	395.700	402.810	252.40

	M_corr2	M_FFM1	M_FFM2	Fasting Ins 1	Fasting Ins 2	Ins_1	Ins_2	Glu - 10' 1	Glu 0' 1	Glu 30' 1	Glu 60' 1	Glu 90' 1
Type:	Real	Real	Real	String	String	Real	Real	Integer	Integer	Real	Real	Real
Source:	User Enter...	User Entered	User Entered	User Entered	User Entered	User En...	User En...	User Entered	User Enter...	User Entered	User Entered	User Entered
Class:	Continuous	Continuous	Continuous	Nominal	Nominal	Continu...	Continu...	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	Free Form...	Free Form...	Free Form...	•	•	Free Fo...	Free Fo...	•	•	Free Forma...	Free Forma...	Free Forma...
Dec. Places:	3	2	2	•	•	2	2	•	•	2	2	2
Mean:	490.186	11.36	11.82	•	•	76.31	77.57	74.450	74.000	73.08	75.33	75.75
Std. Deviation:	167.515	2.85	3.53	•	•	14.92	18.32	3.649	3.627	4.85	3.52	3.21
Std. Error:	38.430	.64	.81	•	•	3.34	4.20	.816	.811	1.08	.79	.72
Variance:	28061.141	8.14	12.48	•	•	222.48	335.55	13.313	13.158	23.51	12.39	10.30
Coeff. of Variation:	.342	.25	.30	•	•	.20	.24	.049	.049	.07	.05	.04
Minimum:	213.901	7.03	5.39			54.00	51.33	66	67	66.33	68.33	71.16
Maximum:	830.881	16.39	18.79			102.00	123.00	81	79	81.33	82.66	84.50
Range:	616.981	9.36	13.40	•	•	48.00	71.67	15.000	12.000	15.00	14.33	13.34
Count:	19	20	19	20	19	20	19	20	20	20	20	20
Missing Cells:	2	1	2	1	2	1	2	1	1	1	1	1
Sum:	9313.535	227.20	224.52	•	•	1526.29	1473.79	1489.000	1480.000	1461.60	1506.60	1515.10
Sum of Squares:	5070465.055	2735.68	2877.79	•	•	120705....	120359....	111109.000	109770.000	107260.37	113727.50	114972.09

	M_corr2	M_FFM1	M_FFM2	Fasting Ins 1	Fasting Ins 2	Ins_1	Ins_2	Glu - 10' 1	Glu 0' 1	Glu 30' 1	Glu 60' 1	Glu 90' 1
1	•	•	•			•	•	•	•	•	•	•
2	456.344	9.91	12.32	<5	<5	85.27	71.50	75	75	81.00	72.33	78.66
3	397.169	8.67	9.79	6	7	69.90	123.00	66	70	71.16	79.66	71.16
4	519.265	14.86	15.06	<5	6	88.00	91.00	77	78	69.50	78.83	78.66
5	601.239	16.39	15.79	<5	<5	86.90	63.43	73	77	67.66	74.16	73.83
6	•	9.13	•	37		57.00	•	69	68	68.33	68.33	74.00
7	325.789	9.46	9.09	<6.6	<6.6	54.00	57.70	79	78	79.33	75.16	74.33
8	466.230	11.71	11.63	<5	<5	85.40	100.47	75	76	71.50	77.83	74.50
9	470.661	13.10	11.19	<6.6	<6.6	80.40	58.40	81	79	68.66	73.83	74.33
10	591.675	10.34	12.79	<5	<5	59.10	56.60	75	76	75.00	76.16	75.00
11	552.842	12.17	12.49	<5	<5	56.23	51.33	73	73	74.83	69.50	73.83
12	213.901	7.03	5.39	11	11	86.07	82.30	77	73	78.83	82.66	84.50
13	531.632	13.86	12.84	5	<5	85.33	79.30	76	77	67.33	78.50	82.16
14	830.881	8.53	18.79	<6.6	<6.6	60.70	65.10	72	67	78.16	75.00	75.66
15	595.210	15.80	13.44	<5	<5	94.57	70.27	74	75	67.50	72.16	73.66
16	247.163	7.25	6.66	9	14	78.63	77.73	79	75	75.50	79.50	76.00
17	689.000	11.83	15.16	8	8	70.63	92.20	76	74	73.16	75.66	73.66
18	741.866	15.54	15.86	<5	<5	61.00	71.30	75	77	66.33	73.83	74.50
19	472.180	12.35	10.37	8	8	68.03	72.13	69	68	74.83	73.50	73.33
20	350.523	9.83	9.42	8	8	97.13	98.03	76	74	71.66	73.50	78.33
21	259.964	9.45	6.41	5	9	102.00	92.00	72	70	81.33	76.50	75.00

	Glu 120' 1	Ave Glu 1	Glu -10' 2	Glu 0' 2	Glu 30' 2	Glu 60' 2	Glu 90' 2	Glu 120' 2	Ave Glu 2	Chol_1	Trig_1	HDL_1
Type:	Real	Real	Integer	Integer	Real	Real	Real	Real	Real	Integer	Integer	Integer
Source:	User Entered	User Entered	User Entered	User Ente...	User Entered	User Entered	User Entered	User Entered	User Entered	User Ente...	User Ent...	User Ente...
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuo...	Continuous
Format:	Free Format ...	Free Format...	•	•	Free Forma...	Free Forma...	Free Forma...	Free Format ...	Free Format...	•	•	•
Dec. Places:	2	2	•	•	2	2	2	2	2	•	•	•
Mean:	75.44	74.92	75.316	75.579	77.76	76.87	78.22	76.25	77.32	174.950	95.900	47.000
Std. Deviation:	4.41	2.87	3.801	3.863	19.45	4.98	4.31	4.55	6.08	32.872	25.377	13.381
Std. Error:	.99	.64	.872	.886	4.46	1.14	.99	1.04	1.39	7.350	5.674	2.992
Variance:	19.47	8.24	14.450	14.924	378.43	24.78	18.55	20.67	36.92	1080.576	643.989	179.053
Coeff. of Variation:	.06	.04	.050	.051	.25	.06	.06	.06	.08	.188	.265	.285
Minimum:	68.00	69.95	68	70	65.83	70.50	70.66	70.16	71.66	133	49	32
Maximum:	86.50	83.12	81	80	155.50	89.83	91.50	90.16	97.12	292	143	77
Range:	18.50	13.17	13.000	10.000	89.67	19.33	20.84	20.00	25.46	159.000	94.000	45.000
Count:	20	20	19	19	19	19	19	19	19	20	20	20
Missing Cells:	1	1	2	2	2	2	2	2	2	1	1	1
Sum:	1508.77	1498.37	1431.000	1436.000	1477.44	1460.45	1486.10	1448.84	1469.13	3499.000	1918.000	940.000
Sum of Squares:	114189.19	112412.23	108037.000	108800.000	121697.39	112704.74	116570.40	110853.05	114261.58	632681.000	196172.0...	47582.000

	Glu 120' 1	Ave Glu 1	Glu -10' 2	Glu 0' 2	Glu 30' 2	Glu 60' 2	Glu 90' 2	Glu 120' 2	Ave Glu 2	Chol_1	Trig_1	HDL_1
1	•	•	•	•	•	•	•	•	•	•	•	•
2	75.66	76.91	74	80	71.00	87.66	78.33	78.16	78.78	199	49	73
3	68.00	72.91	73	71	75.83	76.50	80.16	75.16	76.91	157	107	43
4	82.00	77.24	68	70	67.00	76.00	70.66	73.00	71.66	149	77	34
5	74.83	72.62	79	80	79.83	77.33	79.16	81.33	79.41	167	117	47
6	69.16	69.95	•	•	•	•	•	•	•	160	100	32
7	75.33	76.03	81	80	80.83	81.66	84.00	70.50	79.24	167	126	34
8	74.16	74.49	76	77	155.50	78.16	75.83	75.00	97.12	149	112	32
9	72.50	72.33	76	76	72.66	78.83	77.16	74.83	75.87	133	62	50
10	75.33	75.37	76	77	72.16	73.83	76.66	77.00	74.91	167	61	66
11	72.83	72.74	76	74	71.00	73.33	74.50	74.66	73.37	183	114	45
12	86.50	83.12	71	70	70.33	75.50	80.50	77.83	76.04	181	73	54
13	83.00	77.74	80	79	71.83	78.50	78.83	78.83	76.99	165	119	39
14	75.16	75.99	77	78	65.83	72.50	79.16	73.40	72.72	156	113	48
15	75.16	72.12	79	75	67.50	75.83	77.83	78.50	74.91	172	83	40
16	76.16	76.79	80	79	81.16	89.83	91.50	90.16	88.16	292	75	77
17	73.16	73.91	78	77	73.16	73.00	73.50	70.33	72.49	146	84	57
18	78.50	73.29	75	80	80.66	72.66	77.16	77.50	76.99	200	122	36
19	72.00	73.41	71	70	72.83	70.50	77.33	70.16	72.70	191	143	57
20	72.83	74.08	71	73	79.50	74.83	78.50	77.16	77.49	184	81	39
21	76.50	77.33	70	70	68.83	74.00	75.33	75.33	73.37	181	100	37

	LDL_1	Ch_HDL1	ins_0	ins_120	glu_0	glu_120	L2sc_1	L2sc_2	L2vis_1	L2vis_2	L4sc_1	L4sc_2	L4vis_1
Type:	Integer	Real	Real	Real	Real	Real	Integer	Real	Integer	Real	Integer	Long Inte...	Integer
Source:	User Ent...	User Entered	User En...	User Entered	User En...	User Entered	User Ente...	User Ente...	User Enter...	User Enter...	User Ente...	User Ente...	User Enter...
Class:	Continuous	Continuous	Continu...	Continuous	Continu...	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	•	Free Format ...	Free Fo...	Free Form...	Free Fo...	Free Form...	•	Free Form...	•	Free Form...	•	•	•
Dec. Places:	•	2	3	3	0	0	•	2	•	2	•	•	•
Mean:	103.800	3.91	7.335	38.537	81	79	9245.500	10202.60	3771.600	3495.76	14704.294	20586.000	3617.235
Std. Deviation:	34.481	.91	2.942	35.554	6	17	4988.054	5775.94	1752.354	1814.02	6604.733	9460.874	1265.633
Std. Error:	7.710	.20	.658	8.157	1	4	1577.361	1291.54	554.143	405.63	1601.883	2170.473	306.961
Variance:	1188.905	.83	8.656	1264.121	39	289	2.488E7	33361439....	3070744.2...	3290683.81	4.362E7	8.951E7	1601826.9...
Coeff. of Variation:	.332	.23	.401	.923	8E-2	2E-1	.540	.57	.465	.52	.449	.460	.350
Minimum:	16	2.53	5.000	11.000	69	51	3352	97.96	1779	71.15	5306	8812	1438
Maximum:	200	5.60	14.800	153.600	92	111	17852	20561.00	7762	6848.00	29532	40379	6404
Range:	184.000	3.07	9.800	142.600	23	60	14500.000	20463.04	5983.000	6776.85	24226.000	31567.000	4966.000
Count:	20	20	20	19	19	19	10	20	10	20	17	19	17
Missing Cells:	1	1	1	2	2	2	11	1	11	1	4	2	4
Sum:	2076.000	78.26	146.700	732.200	1539	1498	92455.000	204051.96	37716.000	69915.15	249973.000	391134.000	61493.000
Sum of Squares:	238078.0...	321.98	1240.510	50970.860	125378	123237	1078718879	2.72E9	169886364	30692940...	4373636463	9663031036	248063881

	LDL_1	Ch_HDL1	ins_0	ins_120	glu_0	glu_120	L2sc_1	L2sc_2	L2vis_1	L2vis_2	L4sc_1	L4sc_2	L4vis_1
1	•	•	•	•	•	•	•	•	•	•	•	•	•
2	16	2.73	5.000	13.000	82	78	•	6493.00	•	1735.00	7809	12631	1438
3	93	3.65	11.000	94.000	79	81	4207	5440.00	3795	3140.00	5440	12841	3140
4	100	4.40	5.000	11.000	70	51	•	11919.00	•	3155.00	14767	18821	3793
5	97	3.55	6.300	16.000	82	87	•	5457.00	•	1436.00	5306	•	3203
6	108	5.00	7.000	18.000	83	64	•	6520.00	•	2220.00	13150	11976	3929
7	108	4.91	5.300	21.300	89	77	•	7792.00	•	3272.00	16136	13993	4288
8	95	4.70	7.000	39.000	87	71	•	11815.00	•	3219.00	•	21447	•
9	71	2.66	5.000	31.900	83	104	4807	3847.00	1779	1616.00	13065	8812	2400
10	89	2.53	5.000	13.000	82	64	7872	9642.00	4260	5854.00	12513	13401	5060
11	115	4.10	6.000	14.000	79	66	•	10623.00	•	3391.00	13871	21091	2851
12	112	3.35	14.800	153.600	69	111	11920	97.96	7762	71.15	21480	21355	6404
13	102	4.20	12.000	45.000	82	76	•	17521.00	•	4344.00	•	40379	•
14	85	3.25	5.000	21.800	82	103	15136	18210.00	2694	4099.00	•	26343	•
15	115	4.30	12.000	22.000	87	75	•	18482.00	•	6848.00	17056	36109	4862
16	200	3.79	6.400	58.000	92	111	17852	17978.00	4542	6105.00	29532	29838	4707
17	72	2.56	8.700	35.600	74	65	12532	11622.00	2518	2013.00	24624	24992	3707
18	140	5.60	5.000	17.000	86	69	5315	6710.00	3237	4549.00	9813	11847	2128
19	105	3.35	5.200	•	72	69	3352	4042.00	2185	2176.00	8336	12350	3013
20	129	4.72	6.000	37.000	•	•	9462	9280.00	4944	4500.00	18400	16672	4389
21	124	4.90	9.000	71.000	79	76	•	20561.00	•	6172.00	18675	36236	2181

	L4vis_2	RTatt_1	RTatt_2	LTatt_1	LTatt_2	Avatt_1	Avatt_2	RTarea_1	RTarea_2	LTarea_1	LTarea_2	RTsc_1	RTsc_2
Type:	Integer	Real	Real	Real	Real	Real	Real	Integer	Integer	Integer	Integer	Integer	Integer
Source:	User Enter...	User Enter...	User Enter...	User Ente...	User Ente...	User Ente...	User Ente...	User Entered	User Entered	User Entered	User Entered	User Enter...	User Enter...
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	•	Free Form...	Free Form...	Free Form...	Free Form...	Free For...	Free For...	•	•	•	•	•	•
Dec. Places:	•	2	2	2	2	2	2	•	•	•	•	•	•
Mean:	4030.526	48.22	50.16	48.41	49.83	48.99	49.99	11977.833	11491.556	11749.889	11274.056	9889.944	10248.500
Std. Deviation:	1529.070	2.40	1.73	2.57	2.35	2.01	1.96	1575.179	1672.613	1625.093	1686.158	2996.194	3103.146
Std. Error:	350.793	.57	.41	.61	.55	.46	.46	371.273	394.239	383.038	397.431	706.210	731.418
Variance:	2338055.4...	5.77	2.98	6.61	5.50	4.05	3.83	2481189.559	2797632.967	2640926.810	2843128.056	8977177.3...	9629513.0...
Coeff. of Variation:	.379	.05	.03	.05	.05	.04	.04	.132	.146	.138	.150	.303	.303
Minimum:	1907	43.90	45.60	44.70	45.70	45.70	45.65	9200	7961	8452	7592	5147	6013
Maximum:	7300	51.80	53.20	53.00	55.90	52.07	54.05	16354	14929	15919	14589	14350	15841
Range:	5393.000	7.90	7.60	8.30	10.20	6.37	8.40	7154.000	6968.000	7467.000	6997.000	9203.000	9828.000
Count:	19	18	18	18	18	19	18	18	18	18	18	18	18
Missing Cells:	2	3	3	3	3	2	3	3	3	3	3	3	3
Sum:	76580.000	867.90	902.80	871.40	897.00	930.80	899.90	215601.000	206848.000	211498.000	202933.000	178019.000	184473.000
Sum of Squares:	350742704	41945.37	45331.14	42297.80	44794.00	45672.25	45055.05	2624613067....	2424565044....	2529979756	2336211093	1913210035	2054273263

	L4vis_2	RTatt_1	RTatt_2	LTatt_1	LTatt_2	Avatt_1	Avatt_2	RTarea_1	RTarea_2	LTarea_1	LTarea_2	RTsc_1	RTsc_2
1	•	•	•	•	•	•	•	•	•	•	•	•	•
2	3149	45.00	49.20	45.40	49.70	46.53	49.45	11472	9969	10636	9305	12223	9286
3	3069	50.80	•	50.10	•	50.45	•	11782	•	11772	•	7145	•
4	4074	49.80	51.30	51.30	49.40	50.80	50.35	10952	11379	10717	11022	6627	7949
5	•	46.70	49.60	45.90	49.20	47.40	49.40	9200	7961	8452	7592	12745	9235
6	3488	49.80	50.60	49.10	49.70	49.83	50.15	12009	11659	10757	10412	7877	6013
7	4342	51.80	51.20	51.10	50.80	51.37	51.00	10564	10737	10143	10040	5147	7247
8	3439	•	50.80	•	50.00	•	50.40	•	11993	•	11537	•	9697
9	2116	51.10	•	51.00	•	51.05	•	12774	•	12525	•	8470	•
10	5558	46.20	49.60	45.00	49.60	46.93	49.60	12195	12834	12516	13422	8537	11631
11	1907	47.30	48.90	46.40	49.40	47.53	49.15	13284	13190	12534	12689	7586	6985
12	6869	50.00	50.50	50.30	49.60	50.27	50.05	11571	10455	11786	10690	8650	14504
13	3628	•	49.80	•	49.80	49.80	49.80	•	10247	•	10487	•	15841
14	4442	44.80	45.60	47.00	45.70	45.80	45.65	11543	11564	12649	12375	14350	11272
15	7300	43.90	48.40	44.80	45.70	45.70	47.05	13356	13102	12511	12239	14028	11740
16	5420	48.30	49.30	48.70	49.00	48.77	49.15	9783	9827	9628	9614	12654	13603
17	3776	49.00	51.50	48.80	51.10	49.77	51.30	12331	12964	12479	12393	14314	14525
18	2079	45.80	49.10	44.70	47.70	46.53	48.40	16354	14929	15919	14589	7298	6928
19	2328	48.20	53.20	49.20	53.10	50.20	53.15	13286	13039	13322	13044	13002	13008
20	4503	48.40	52.00	49.60	51.60	50.00	51.80	11987	11166	11624	10946	8522	6893
21	5093	51.00	52.20	53.00	55.90	52.07	54.05	11158	9833	11528	10537	8844	8116

	LTsc_1	LTsc_2	Thi_sc1	Thi_sc2	Thi_ar1	Thi_ar2	TEE_1	TEE_2	EEPA_1	EEPA_2	NVAEE_1	NVAEE_2	PAL_1
Type:	Integer	Integer	Real	Real	Real	Real	Integer	Integer	Real	Real	Real	Real	Real
Source:	User Ente...	User Ente...	User Enter...	User Enter...	User Enter...	User Enter...	User Ent...	User Ent...	User Entered	User Entered	User Entered	User Entered	User Ent...
Class:	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	•	•	Free Form...	Free Form...	Free Form...	Free Form...	•	•	Free Form...	Free Form...	Free Format ...	Free Format ...	Free For...
Dec. Places:	•	•	2	2	2	2	•	•	2	2	2	2	2
Mean:	9787.556	10316.944	9838.75	10282.72	11863.86	11382.81	2568.250	2609.842	933.13	945.70	426.56	589.63	1.87
Std. Deviation:	2853.420	3150.035	2920.16	3119.82	1575.61	1656.28	345.976	426.135	252.38	288.57	283.82	386.58	.21
Std. Error:	672.558	742.470	688.29	735.35	371.37	390.39	77.363	97.762	56.43	66.20	70.95	99.81	.05
Variance:	8142006.2...	9922721.3...	8527321.48	9733275.21	2482538.17	2743250.24	119699.6...	181591.2...	63693.96	83271.55	80552.47	149444.51	.05
Coeff. of Variation:	.292	.305	.30	.30	.13	.15	.135	.163	.27	.31	.67	.66	.11
Minimum:	5716	6042	5431.50	6027.50	8826.00	7776.50	1880	1838	382.00	404.20	-58.00	-161.10	1.44
Maximum:	14346	15879	14330.00	15860.00	16136.50	14759.00	3030	3190	1264.30	1401.00	894.10	1303.40	2.33
Range:	8630.000	9837.000	8898.50	9832.50	7310.50	6982.50	1150.000	1352.000	882.30	996.80	952.10	1464.50	.90
Count:	18	18	18	18	18	18	20	19	20	19	16	15	19
Missing Cells:	3	3	3	3	3	3	1	2	1	2	5	6	2
Sum:	176176.000	185705.000	177097.50	185089.00	213549.50	204890.50	51365.000	49587.000	18662.50	17968.30	6825.00	8844.40	35.49
Sum of Squares:	1862746494	2084594431	1.89E9	2068684452	2.58E9	2.38E9	134192455	132682883	18624630.55	18491509.23	4119576.04	7307117.26	67.14

	LTsc_1	LTsc_2	Thi_sc1	Thi_sc2	Thi_ar1	Thi_ar2	TEE_1	TEE_2	EEPA_1	EEPA_2	NVAEE_1	NVAEE_2	PAL_1
1	•	•	•	•	•	•	•	•	•	•	•	•	•
2	11543	9213	11883.00	9249.50	11054.00	9637.00	2432	2112	918.80	880.80	•	•	1.92
3	6891	•	7018.00	•	11777.00	•	2759	2620	1163.10	1068.00	894.10	764.00	2.03
4	6653	8040	6640.00	7994.50	10834.50	11200.50	2477	•	1029.30	•	641.30	•	2.06
5	12840	9931	12792.50	9583.00	8826.00	7776.50	2461	2806	964.90	1015.40	•	825.40	1.97
6	8174	6042	8025.50	6027.50	11383.00	11035.50	3027	2588	1264.30	889.20	•	•	2.07
7	5716	7870	5431.50	7558.50	10353.50	10388.50	2401	2006	1130.90	595.40	•	•	2.33
8	•	9144	•	9420.50	•	11765.00	2221	2251	708.90	705.90	338.90	590.90	1.72
9	8021	•	8245.50	•	12649.50	•	2514	2439	882.60	755.10	178.60	521.20	1.82
10	8837	11664	8687.00	11647.50	12355.50	13128.00	2897	2988	1107.30	1149.20	621.30	766.20	•
11	7624	7335	7605.00	7160.00	12909.00	12939.50	2986	3019	1207.40	1177.10	471.40	474.10	2.02
12	8661	14607	8655.50	14555.50	11678.50	10572.50	2152	1838	566.80	404.20	516.80	350.20	1.72
13	•	15879	•	15860.00	•	10367.00	2200	2463	620.00	766.70	-58.00	672.70	1.62
14	14136	11787	14243.00	11529.50	12096.00	11969.50	2728	3187	915.20	1268.30	435.20	1143.30	1.77
15	13841	11214	13934.50	11477.00	12933.50	12670.50	3030	3171	1131.00	1173.90	570.00	-161.10	1.80
16	12537	13255	12595.50	13429.00	9705.50	9720.50	1880	3096	382.00	1386.40	40.00	1303.40	1.44
17	14346	15340	14330.00	14932.50	12405.00	12678.50	2961	3190	1134.90	1401.00	604.90	405.00	1.94
18	7122	6499	7210.00	6713.50	16136.50	14759.00	2885	2364	1176.50	797.60	518.50	•	2.03
19	12033	12977	12517.50	12992.50	13304.00	13041.50	2824	2472	971.60	714.80	801.00	538.80	1.80
20	8616	6567	8569.00	6730.00	11805.50	11056.00	2387	2806	848.30	1225.40	298.30	735.40	1.84
21	8585	8341	8714.50	8228.50	11343.00	10185.00	2143	2171	538.70	593.90	-47.30	-85.10	1.54

	PAL_2	Lep_1	Lep_2	En_int	Prot_g	CHO_g	Fat_g	Sat_g	Mono_g	Poly_g	Chol_mg	Fiber	Per_Pro	per_CHO
Type:	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real
Source:	User Ent...	User Ent...	User Ent...	User Ent...	User Ent...	User Ente...	User En...	User En...	User Enter...	User Ent...	User Entered	User En...	User Entered	User Entered
Class:	Continuous	Continuo...	Continuo...	Continuo...	Continuous	Continuous	Continu...	Continu...	Continuous	Continuous	Continuous	Continu...	Continuous	Continuous
Format:	Free For...	Free For...	Free For...	Free For...	Free For...	Free Form...	Free Fo...	Free For...	Free Form...	Free For...	Free Format...	Free Fo...	Free Form...	Free Format...
Dec. Places:	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mean:	1.86	7.01	9.73	2082.89	70.41	306.55	66.81	24.42	25.40	13.52	201.59	19.76	.14	.59
Std. Deviation:	.21	4.05	6.69	517.77	17.28	84.07	20.83	8.75	7.44	5.53	101.17	7.87	.02	.07
Std. Error:	.05	1.43	1.73	118.79	3.96	19.29	4.78	2.06	1.75	1.30	23.85	1.86	.01	.02
Variance:	.05	16.37	44.70	268089.20	298.60	7067.95	433.78	76.60	55.31	30.54	10234.60	61.98	5.53E-4	.01
Coeff. of Variation:	.11	.58	.69	.25	.25	.27	.31	.36	.29	.41	.50	.40	.17	.12
Minimum:	1.47	3.80	3.20	1097.32	27.12	164.24	32.05	12.28	11.62	4.90	53.91	7.10	.10	.45
Maximum:	2.21	15.10	25.20	3463.25	109.27	499.09	122.66	51.39	43.65	25.28	479.40	36.30	.20	.74
Range:	.74	11.30	22.00	2365.92	82.15	334.85	90.60	39.11	32.03	20.38	425.49	29.20	.10	.30
Count:	19	8	15	19	19	19	19	18	18	18	18	18	18	18
Missing Cells:	2	13	6	2	2	2	2	3	3	3	3	3	3	3
Sum:	35.32	56.10	146.00	39574.94	1337.75	5824.50	1269.41	439.55	457.21	243.34	3628.59	355.74	2.44	10.54
Sum of Squares:	66.48	507.97	2046.86	8.73E7	99562.65	1912741.89	92618.86	12035.94	12553.49	3808.73	905469.78	8084.44	.34	6.26

	PAL_2	Lep_1	Lep_2	En_int	Prot_g	CHO_g	Fat_g	Sat_g	Mono_g	Poly_g	Chol_mg	Fiber	Per_Pro	per_CHO
1	•	•	•	•	•	•	•	•	•	•	•	•	•	•
2	2.07	•	7.60	2319.31	64.65	352.16	77.72	30.28	29.04	12.57	202.23	22.04	.11	.61
3	2.03	5.10	•	2121.46	65.79	332.68	63.45	25.94	22.57	10.03	298.40	21.05	.12	.53
4	•	5.30	8.70	1999.51	58.94	305.37	53.31	16.16	22.60	10.47	91.27	23.44	.12	.61
5	1.86	•	5.50	1817.84	65.90	238.15	69.41	19.25	26.10	19.33	162.65	11.45	.15	.52
6	1.80	3.80	•	2594.00	69.00	412.00	82.00	26.00	33.00	17.00	170.00	28.00	.11	.64
7	1.66	•	6.30	1535.32	55.34	188.97	64.11	24.57	24.99	10.23	146.86	8.42	.14	.49
8	1.71	•	6.10	1667.50	63.70	233.01	56.31	18.48	22.82	10.39	218.68	15.15	.15	.56
9	1.69	•	3.20	2202.20	77.63	356.55	60.78	17.13	24.50	14.29	101.15	36.30	.14	.65
10	1.94	•	5.80	2707.15	83.86	366.34	91.48	29.09	30.52	25.28	204.19	21.37	.12	.54
11	1.96	3.80	•	2237.26	79.47	292.47	78.29	30.69	27.73	13.98	247.86	20.86	.14	.52
12	1.47	15.10	11.60	2029.00	72.00	269.00	73.00	27.00	24.00	16.00	247.00	13.00	.14	.53
13	1.70	•	•	1659.36	45.34	284.88	43.41	15.64	16.32	8.24	130.48	11.72	.11	.69
14	1.99	•	•	2140.49	77.11	397.58	32.05	12.28	11.62	5.13	53.91	32.45	.14	.74
15	1.89	•	20.30	3463.25	109.27	499.09	122.66	51.39	43.65	19.56	293.97	17.93	.13	.58
16	2.21	•	20.00	1097.32	27.12	164.24	41.70	20.85	13.01	4.90	80.75	22.01	.10	.60
17	2.17	8.00	6.00	1670.69	81.60	264.35	57.86	23.40	29.19	14.82	265.61	18.46	.20	.63
18	1.78	•	4.00	2006.30	76.60	317.60	52.60	•	•	•	•	•	•	•
19	1.64	4.30	6.20	2528.70	88.43	351.77	89.06	30.34	31.45	21.30	234.18	25.01	.14	.56
20	2.16	•	9.50	•	•	•	•	•	•	•	•	•	•	•
21	1.60	10.70	25.20	1778.28	75.99	198.31	60.21	21.07	24.10	9.83	479.40	7.10	.17	.45

	per_Fat	Fat_Sat	Fat_Mon	Fat_Pol	Input Column
Type:	Real	Real	Real	Real	Real
Source:	User Enter...	User Enter...	User Entered	User Enter...	User Entered
Class:	Continuous	Continuous	Continuous	Continuous	Continuous
Format:	Free Form...	Free Form...	Free Forma...	Free Form...	Free Format Fixed
Dec. Places:	2	2	2	2	3
Mean:	.29	.36	.38	.20	•
Std. Deviation:	.05	.05	.04	.05	•
Std. Error:	.01	.01	.01	.01	•
Variance:	2.88E-3	3.02E-3	1.86E-3	2.08E-3	•
Coeff. of Variation:	.18	.15	.11	.23	•
Minimum:	.13	.28	.31	.12	•
Maximum:	.38	.50	.50	.28	•
Range:	.24	.22	.19	.16	•
Count:	18	18	18	18	•
Missing Cells:	3	3	3	3	•
Sum:	5.27	6.53	6.81	3.54	•
Sum of Squares:	1.59	2.42	2.61	.73	•

	per_Fat	Fat_Sat	Fat_Mon	Fat_Pol	Input Column
1	•	•	•	•	
2	.30	.39	.37	.16	
3	.27	.41	.36	.16	
4	.24	.30	.42	.20	
5	.34	.28	.38	.28	
6	.28	.32	.40	.21	
7	.38	.38	.39	.16	
8	.30	.33	.41	.18	
9	.25	.28	.40	.24	
10	.30	.32	.33	.28	
11	.31	.39	.35	.18	
12	.32	.37	.33	.22	
13	.24	.36	.38	.19	
14	.13	.38	.36	.16	
15	.32	.42	.36	.16	
16	.34	.50	.31	.12	
17	.31	.40	.50	.26	
18	•	•	•	•	
19	.32	.34	.35	.24	
20	•	•	•	•	
21	.30	.35	.40	.16	

Final Reports:

Publications:

Dvorak RV, WF Denino, PA Ades, ET Poehlman. Phenotypic characteristics associated with insulin resistance in metabolically obese but normal-weight young women. 48: 2210-2214, 1999.

Poehlman ET, RV Dvorak, WF Denino, M Brochu, PA Ades. Effects of resistance training and endurance training on insulin sensitivity in nonobese, young women: A controlled randomized trial. 85: 2463-2468, 2000.

Poehlman ET, WF Denino, T Beckett, KA Kinaman, IJ Dionne, R Dvorak, PA Ades. Effects of endurance and resistance training on total daily energy expenditure in young women: A controlled randomized trial. In Press, Journal of Clinical Endocrinology and Metabolism.